

# **EXHIBIT A**

**IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF DELAWARE**

IPA TECHNOLOGIES INC.,

Plaintiff,

v.

AMAZON.COM, INC., and AMAZON  
DIGITAL SERVICES, LLC,

Defendants.

C.A. No. 1:16-cv-01266-RGA

**JURY TRIAL DEMANDED**

**FIRST AMENDED COMPLAINT FOR PATENT INFRINGEMENT**

Under Fed. R. Civ. P. 15(a)(2), Plaintiff IPA Technologies Inc. (“IPA”) as and for its First Amended Complaint against Amazon.com, Inc. (“Amazon”) and Amazon Digital Services, LLC (“ADS”) alleges as follows:

**PARTIES**

1. IPA is a Delaware corporation with a principal place of business at 600 Anton Blvd., Suite 1350, Costa Mesa, California 92626.
2. On information and belief, Defendant Amazon.com, Inc. is a Delaware corporation with a principal place of business at 410 Terry Avenue North, Seattle, Washington 98109. Amazon can be served with process through its registered agent, the Corporation Services Company, 2711 Centerville Road, Suite 400, Wilmington, Delaware 19808.
3. On information and belief, Defendant Amazon Digital Services, LLC is a Delaware limited liability company with a principal place of business at 410 Terry Avenue North, Seattle, Washington 98109. ADS can be served with process through its

registered agent, the Corporation Services Company, 2711 Centerville Road, Suite 400, Wilmington, Delaware 19808.

4. Amazon and ADS are referred to collectively as Defendants.

### **JURISDICTION AND VENUE**

5. This action arises under the patent laws of the United States, Title 35 of the United States Code. Accordingly, this Court has subject matter jurisdiction under 28 U.S.C. §§ 1331 and 1338(a).

6. This Court has specific and general personal jurisdiction over Defendants pursuant to due process and/or the Delaware Long Arm Statute, due to Defendants having availed themselves of the rights of benefits of Delaware by incorporating under Delaware law and due to their substantial business in this forum, including: (i) at least a portion of the infringement alleged herein; and (ii) regularly doing or soliciting business, engaging in other persistent courses of conduct, and/or deriving substantial revenue from goods and services provided to individuals in Delaware and in this Judicial District.

7. Venue is proper in this District under 28 U.S.C. §§ 1391 (b)-(c) and 1400(b) because Defendants are subject to personal jurisdiction in this District.

### **BACKGROUND**

8. SRI International, Inc. (“SRI”), the original owner of the patents-in-suit, is an independent, not-for-profit research institute that conducts client-supported research and development for government agencies, commercial businesses, foundations, and other organizations.

9. SRI employs about 2,100 people worldwide, including scientists, engineers, technologists, policy researchers, and corporate and support staff. SRI works

with clients to take the most advanced R&D from the laboratory to the marketplace. SRI collaborates across technical and scientific disciplines to generate real innovation and create value by inventing solutions that solve challenging problems and looks ahead to the needs of the future. For more than 70 years, SRI has led the discovery and design of ground-breaking products, technologies, and industries—from the computer mouse and intelligent personal assistants to robotic surgery, medical ultrasound, cancer treatments, and more. The revenue generated by SRI's R&D projects, commercialization activities, and marketplace solutions is reinvested in SRI capabilities, facilities, and staff to advance its mission.

10. Among its many areas of research, SRI has engaged in fundamental research and development related to intelligent personal assistants and speech-based navigation of electronic data sources.

11. SRI's innovative work on personal digital assistants was a key area of development in one of the world's largest artificial intelligence projects, the Cognitive Assistant that Learns and Organizes ("CALO"). The vision for the SRI-led CALO project, which was funded by the U.S. Defense Advanced Research Projects Agency ("DARPA"), was to create groundbreaking software that could revolutionize how computers support decision-makers.

12. SRI's work on personal digital assistants and speech-based navigation of electronic data sources, which started before the launch of the CALO project, developed further as part of the project. SRI's engineers were awarded numerous patents on their groundbreaking personal digital assistant and speech-based navigation inventions.

13. To bring the personal digital assistant and speech-based navigation technology to the marketplace, SRI formed the spin-off company Siri, Inc. in 2007, and granted it a non-exclusive license to the patent portfolio. The technology was demonstrated as an iPhone app at technology conferences and later released as an iPhone 3GS app in February 2010. In April 2010, Apple Inc. acquired Siri, Inc. In 2011, the Siri personal digital assistant was released as an integrated feature of the iPhone 4S.

14. Intelligent personal assistants and speech-based navigation of electronic data sources have continued to be implemented as effective and user-friendly solutions for interacting with electronic devices.

15. On May 6, 2016, IPA acquired the SRI patent portfolio at issue here. IPA is a wholly-owned subsidiary of WiLAN, a leading technology innovation and licensing business actively engaged in research, development, and licensing of new technologies.

#### **INVENTOR BACKGROUNDS**

16. Co-inventor Adam Cheyer is today a recognized thought leader in the field of artificial intelligence. After obtaining his computer science degree from Brandeis University and his MS in Computer Science and Artificial intelligence (“AI”), Mr. Cheyer served as a researcher in Artificial Intelligence at SRI International. He authored more than 60 publications and 26 issued patents. He was Chief Architect of CALO, the largest AI project in US history. Previously, he was co-founder and VP Engineering of Siri, a mobile phone virtual personal assistant. As a startup, Siri won the Innovative Web Technologies award at SXSW, and was chosen as a Top Ten Emerging Technology by MIT’s Technology Review before Apple purchased Siri in 2010. He is currently co-founder and VP Engineering of Viv Labs, whose goal is to simplify the world by

providing an intelligent interface to everything. Viv Labs is now a wholly-owned subsidiary of Samsung.

17. Co-inventor Dr. Luc Julia is named one of the top 100 most influential French developers in the digital world. After receiving his Ph.D. in Multimodal Human-Computer Interfaces from the Ecole Nationale Supérieure de Telecommunications in Paris, France, Dr. Julia worked at SRI, where he studied agent architectures, co-founded Nuance Communications (a world leader in speech recognition) and served as co-founder and director of the Computer Human Interactive Center (CHIC!). He was also Chief Technologist at Hewlett-Packard Company, and Director of Siri at Apple, Inc. He now serves as VP of Innovation at Samsung Electronics' Strategy and Innovation Center.

18. Co-inventor Christine Halverson obtained her MS and Ph.D. in Cognitive Science while working at NASA's Ames Research Center building next-generation air traffic control software. She worked for SRI as an Interim Program Director of SRI's CHIC! Most recently she has served at IBM as a researcher at the Thomas J. Watson Research Center for a total of 16 years in the areas of human computer interaction, and the PERCS (Productive Easy-to-Use Reliable Computing System) program, which was part of a DARPA challenge in the High Performance Computing System (HPCS) mandate to develop a peta-scale computer.

19. Co-inventor Dimitris Voutsas has a Masters in Computer Science and worked as a Research & Development Engineer at SRI's CHIC! For the last twelve years he has served at Microsoft as a Project Manager for Windows and Windows Phone, and currently serves as Senior Program Manager for Microsoft's Bing.

20. Co-inventor David L. Martin worked as a Senior Computer Scientist at the Artificial Intelligence Center of SRI International for over 16 years and worked as the Senior Manager for Applications Engineering at Siri Inc. and later as an Engineering Manager at Apple Inc. upon Apple's acquisition of Siri. Since August 2013, he has served as the Senior Research Scientist at Nuance Communications, focusing on artificial intelligence research.

#### PATENT PROSECUTION AND EXAMINATION

21. Examiners at the United States Patent and Trademark Office ("USPTO") review patent applications to determine whether a claimed invention should be granted a patent. In general, the most important task of a patent examiner is to review the technical information disclosed in a patent application and to compare it to the state of the art. This involves reading and understanding a patent application, and then searching the prior art to determine what technological contribution the application teaches the public. A patent is a reward for informing the public about specific technical details of a new invention. The work of a patent examiner includes searching prior patents, scientific literature databases, and other resources for prior art. Then, an examiner reviews the claims of the patent application substantively to determine whether each complies with the legal requirements for granting of a patent. A claimed invention must meet patentability requirements including statutory subject matter, novelty, inventive step or non-obviousness, industrial application (or utility) and sufficiency of disclosure, and examiners must apply federal laws (Title 35 of the United States Code), rules, judicial precedents, and guidance from agency administrators.

22. To have signatory authority (either partial or full), Examiners must pass a test equivalent to the Patent Bar. All examiners must have a college degree in engineering

or science. Examiners are assigned to “Art Units,” typically groups of 8-15 Examiners in the same area of technology. Thus, by way of required background and work experience, Examiners have special knowledge and skill concerning the technologies examined by them and in their particular Art Unit.

23. The basic steps of the examination consist of:

- reviewing patent applications to determine if they comply with basic format, rules and legal requirements;
- determining the scope of the invention claimed by the inventor;
- searching for relevant technologies to compare similar prior inventions with the invention claimed in the patent application; and
- communicating findings as to the patentability of an applicant's invention via a written action to inventors/patent practitioners.

24. Communication of findings as to patentability are done by way of one or more Office Actions in which the Examiner accepts or rejects proposed claims filed by the applicant(s) and provides reasons for rejections. The applicant(s) are then permitted to file a Response to Office Action, in which claims may be amended to address issues raised by the Examiner, or the applicant states reasons why the Examiner’s findings are incorrect. If an applicant disagrees with a Final Rejection by an Examiner, the applicant may file an appeal with the Patent Trial and Appeal Board (“PTAB”). If, after this process, the USPTO determines that the application meets all requirements, a patent is duly allowed, and after an issue fee is paid, the patent is issued.

25. A patent duly allowed and issued by the USPTO is presumptively valid and becomes the property of the inventor(s) or assignee(s).



26. A “Continuation Application” is one where, typically after allowance but in any event prior to issuance, the inventor applies for a second, related patent. A Continuation employs substantially the same invention disclosure as the previous, allowed application, but seeks new or different claims.

### **ASSERTED PATENTS**

#### **U.S. Patent No. 6,851,115**

27. IPA is the owner by assignment of U.S. Patent No. 6,851,115 (the “’115 patent”). The ’115 Patent is entitled “Software-based Architecture for Communication and Cooperation Among Distributed Electronic Agents.” The ’115 Patent issued on February 1, 2005. A true and correct copy of the ’115 Patent is attached as **Exhibit D**.

28. The ’115 Patent “is generally related to distributed computing environments and the completion of tasks within such environments . . . [and in particular] teaches a variety of software-based architectures for communication and cooperation among distributed electronic agents.” ’115 Patent at Col. 1, lines 25–29 (hereinafter 1:25–29).

29. The claimed inventions in the ’115 Patent are directed to new and improved computer functionality and technological processes that address problems rooted in and arising from computer technology.

30. When initially filed, the applicants submitted their patent application and patent specification with an appendix containing five source files, cumulatively spanning more than 130 pages of source code.

31. The background section of the ’115 Patent specifies the need for an improved and intuitive computer-user interface:

More than ever before, the increasing complexity of systems, the development of new technologies, and the availability of multimedia material and environments are creating a demand for more accessible and intuitive user interfaces. Autonomous, distributed, multi-component systems providing sophisticated services will no longer lend themselves to the familiar “direct manipulation” model of interaction, in which an individual user masters a fixed selection of commands provided by a single application. Ubiquitous computing, in networked environments, has brought about a situation in which the typical user of many software services is likely to be a non-expert, who may access a given service infrequently or only a few times.

’115 Patent at 2:21-33.

32. An overview of the inventions of the ’115 Patent emphasize the improved functioning of the underlying computer’s software architecture:

A first embodiment of the present invention discloses a highly flexible, software-based architecture for constructing distributed systems. The architecture supports cooperative task completion by flexible, dynamic configurations of autonomous electronic agents. Communication and cooperation between agents are brokered by one or more facilitators, which are responsible for matching requests, from users and agents, with descriptions of the capabilities of other agents. It is not generally required that a user or agent know the identities, locations, or number of other agents involved in satisfying a request, and relatively minimal effort is involved in incorporating new agents and “wrapping” legacy applications. Extreme flexibility is achieved through an architecture organized around the declaration of capabilities by service-providing agents, the construction of arbitrarily complex goals by users and service-requesting agents, and the role of facilitators in delegating and coordinating the satisfaction of these goals, subject to advice and constraints that may accompany them.

’115 Patent at 4:58-5:8.

33. The fundamental technological nature of the improvements to computer functionality from the inventive software architecture and methods improve the flexibility and expandability of the underlying system as whole is described one way as follows:

As new agents connect to the facilitator, registering capability specifications and natural language vocabulary, what the user can say and do dynamically changes; in other words, the ICL is dynamically expandable. For example, adding a calendar agent to the system in the previous example and registering its capabilities enables users to ask natural language questions about their “schedule” without any need to revise code for the facilitator, the natural language agents, or

any other client agents. In addition, the interpretation and execution of a task is a distributed process, with no single agent defining the set of possible inputs to the system. Further, a single request can produce cooperation and flexible communication among many agents, written in different programming languages and spread across multiple machines.

'115 Patent at 8:41-55.

34. One of most important technical improvements to the underlying computer functionality is the invention's ability to process compound or complex goals, which is a significant improvement over even SRI's own earlier Open Agent Architecture technology:

#### Complex Goal Expressions

A powerful feature provided by preferred embodiments of the present invention is the ability of a client agent (or a user) to submit compound goals of an arbitrarily complex nature to a facilitator. A compound goal is a single goal expression that specifies multiple sub-goals to be performed. In speaking of a "complex goal expression" we mean that a single goal expression that expresses multiple sub-goals can potentially include more than one type of logical connector (e.g., AND, OR, NOT), and/or more than one level of logical nesting (e.g., use of parentheses), or the substantive equivalent. By way of further clarification, we note that when speaking of an "arbitrarily complex goal expression" we mean that goals are expressed in a language or syntax that allows expression of such complex goals when appropriate or when desired, not that every goal itself is necessarily complex.

'115 Patent at 14:43-59; Compare with 4:34-55.

35. The '115 Patent contains six independent claims and 89 total claims, covering various methods, systems, and computer programs. Claim 61 is a facilitator agent claim:

61. A facilitator agent arranged to coordinate cooperative task completion within a distributed computing environment having a plurality of autonomous service-providing electronic agents, the facilitator agent comprising:

an agent registry that declares capabilities of service-providing electronic agents currently active within the distributed computing environment; and  
a facilitating engine operable to parse a service requesting order to interpret a compound goal set forth therein, the compound goal including both local and

global constraints and control parameters, the service request formed according to an Interagent Communication Language (ICL), wherein the ICL includes:

a layer of conversational protocol defined by event types and parameter lists associated with one or more of the events, wherein the parameter lists further refine the one or more events; and

a content layer comprising one or more of goals, triggers and data elements associated with the events; and

the facilitating engine further operable to construct a goal satisfaction plan by using reasoning that includes one or more of domain-independent coordination strategies, domain-specific reasoning, and application-specific reasoning comprising rules and learning algorithms.

36. The above-disclosed claim limitations from the '115 Patent comprise various elements, including, e.g., a facilitator agent that coordinates task completion within a distributed computing environment with autonomous service-providing electronic agents, where the facilitator agent includes (i) an agent registry that declares capabilities of service-providing electronic agents and (ii) an engine to parse a service requesting order to interpret a compound goal, including both local and global constraints and control parameters, the service request formed according to an Interagent Communication Language (ICL), a layer of conversational protocol defined by event types and parameter lists associated with one or more of the events, wherein the parameter lists further refine the one or more events; and a content layer comprising one or more of goals, triggers and data elements associated with the events; and the facilitating engine further operable to construct a goal satisfaction plan by using reasoning that includes one or more of domain-independent coordination strategies, domain-specific reasoning, and application-specific reasoning comprising rules and learning algorithms. This claim, as a whole, provides significant benefits and improvements discussed previously that directly impact the capacity and functionality of

the underlying computer software architecture, such as unprecedented ease to expand the agent-based system with increased functionality without any need to revise code for the facilitator, the natural language agents, or any other client agents, as well as a greater degree of freedom for users to use, and for the claimed system to accept and process an expanded set of more complex and compound requests and inquiries, relative to the prior art.

37. The above-disclosed and claimed facilitator agent in a distributed computing environment with service-providing electronic agents additionally constitutes an unconventional technical solution (for example, a facilitator agent using a specialized interagent communication language with a unique (i) conversation protocol layer defined by event types and parameter lists associated with one or more of the events, wherein the parameter lists further refine the one or more events; and (ii) content layers with goals, triggers, and data elements associated with the events) to address a technological problem rooted in computer technology of coordinating and completing tasks using service-providing electronic agents in a distributed computer environment.

#### Prosecution and Examination of the '115 Patent

38. The examination of the '115 Patent required over six years, from the date of the filing of the patent application on January 5, 1999, through the issue date of February 1, 2005.

39. Three Patent Examiners were involved in examining the application that matured into the '115 Patent, namely, Examiner Lewis A. Bullock, Jr., and Supervisory Examiners St. John Courtenay III and John Follansbee.

40. Although the publicly available prosecution history of the '115 Patent does not contain a complete summary of various patent examiner searches, it indicates that Examiner Bullock conducted prior art and/or other searches using at least the patent examiner systems Web-based Examiner Search Tool ("WEST") and Examiner Automated Search Tool ("EAST"), and performed searches on at least July 10, 2002; July 20, 2003; November 20, 2003; August 31, 2004; and September 3, 2004. The Patent Examiners formally cited at least 19 separate references during the prosecution of the '115 Patent.

41. Between the prior art references located by and cited by the Patent Examiners, and the references submitted by the applicants and considered by the Patent Examiners during the prosecution of the '115 Patent, at least 12 patent references and 22 non-patent references were formally considered by the Patent Examiners, as indicated on the front two pages of the issued '115 Patent.

42. On information and belief, it is the practice of the USPTO not to cite excessive cumulative art, in other words, in this instance, the art cited by the Patent Examiners is representative of considerable other art located by the USPTO and not cited. Further on information and belief, it is the practice of the USPTO to discuss in its Office Actions those references of which the Patent Examiners are aware that most closely resemble the claimed inventions.

43. On September 10, 2004, the USPTO issued a Notice of Allowance as to all of claims 1-89 presently in the '115 Patent.

44. The issued claims from the '115 Patent are patentably distinct from the at least 34 references identified and/or discussed during prosecution. That is, each of the 89

claims, as a whole—which include, e.g., electronic agents in a distributed environment that use an inter-agent language that includes (i) a layer of conversational protocol defined by event types and parameter lists associated with one or more of the events, wherein the parameter lists further refine the one or more events, and (ii) a content layer comprising one or more of goals, triggers and data elements associated with the events, and/or constructing a goal satisfaction plan that includes using reasoning that includes one or more of domain-independent coordination strategies, domain-specific reasoning, and application-specific reasoning comprising rules and learning algorithms, and/or the inter-agent language supporting compound goal expressions such that goals within a single request may be coupled by one or more operators comprising a conditional execution operator, and parallel disjunctive operation that indicates disjunct goals are to be performed by different agents —were found to be patentably distinct from at least the 34 formally identified references.

45. The references cited during the examination of the '115 Patent all represent patentably distinct and in some instances prior art means or methods to navigate electronic data sources. By allowing the claims of the '115 Patent, each of the claims in the '115 Patent, as a whole was shown to be inventive, novel, and innovative over at least the 34 formally identified references.

46. As each claim as a whole from the '115 Patent is inventive, novel, and innovative as compared to several specific patents and other publications, each claim as a whole, constitutes more than the application of well-understood, routine, and conventional activities.

47. As of February 19, 2018, the '115 Patent has been cited as pertinent prior art by a USPTO examiner or an applicant during the prosecution of at least 266 issued patents and published applications—including during the prosecution of patent applications filed by leading technology companies such as IBM, Toshiba, Microsoft, Apple, Hewlett-Packard, Nuance Communications, and Google. Out of the at least 266 patent applications in which the '115 Patent was cited as pertinent prior art during prosecution, the USPTO has issued more than 169 patents.

48. The 266 forward citations to the '115 Patent—and at least 169 patents that have issued despite identification of the '115 Patent during their prosecution—reveal that the '115 Patent and its claimed inventions are directed to specific methods, systems, and programs for an improved software-based architecture for distributed electronic agents to communicate and cooperate, rather than merely disclosing an aspiration or result of that technology that would preempt the use of, or innovations in software-based architectures for distributed electronic agent communication and cooperation.

49. The '115 patent claims priority to January 5, 1999. The technology disclosed and claimed in the '115 Patent was not then well-understood, routine or conventional. To the contrary, the technology claimed in the '115 Patent was well ahead of the state of the art at the time of the invention. For example, every Office Action rejection during the entire prosecution of the application that issued as the '115 patent was entirely or partially based on publications where one or more inventors was an author or co-author of the reference.

**U.S. Patent No. 7,069,560**

50. IPA is the owner by assignment of U.S. Patent No. 7,069,560 (the "'560 Patent"). The '560 Patent is entitled "Highly Scalable Software-Based Architecture for



Communication and Cooperation Among Distributed Electronic Agents.” The ’560 Patent issued on June 27, 2006. A true and correct copy of the ’560 Patent is attached hereto as **Exhibit E**.

51. The ’560 Patent “is generally related to distributed computing environments and the completion of tasks within such environments . . . [and in particular] teaches a variety of software-based architectures for communication and cooperation among distributed electronic agents.” ’560 Patent at Col. 1, lines 25–29 (hereinafter 1:25–29).

52. The claimed inventions in the ’560 Patent are directed to new computer functionality and improvements to technological processes that address problems rooted in and arising from computer technology.

53. The ’560 Patent, at 1:5-12, incorporates by reference and identifies as a related application U.S. Patent Application 09/225,198, filed January 5, 1999 (the parent application that issued as the ’115 Patent).

54. The ’560 Patent is a continuation of the ’115 Patent discussed immediately above. The specifications of the ’115 and ’560 Patents are therefore substantially identical, and paragraphs 30-34 above regarding the specification and state of the art of the ’115 Patent are incorporated by reference as if fully restated here in this section for the ’560 Patent.

55. The ’560 Patent contains seven independent claims and 55 total claims, covering various methods, systems, and computer programs. Claim 52 states:

52. A computer implemented process for providing coordinated task completion within a distributed computing environment, the distributed computing environment including a plurality of autonomous electronic agents, the computer implemented method comprising the steps of:

providing at least one agent registry including capabilities of service providing electronic agents;

interpreting a service request in the form of a base goal, the service request being in a interagent communication language (ICL), the ICL including a layer of conversational protocol defined by event types and parameter lists associated with one or more of the events, wherein the parameter lists further refine the one or more events;

determining a plurality of sub goals necessary to accomplish the base goal; selecting from said registry at least one service providing agent capable of completing said sub goals; delegating at least one sub goal as a peer to peer service request directly from a service requesting agent to a service providing agent; and

delegating any remaining sub goals as service request in the interagent communication language to the selected agents capable of completing the remaining sub-goals.

56. The above-disclosed method claim from the '560 Patent includes various elements or steps, including, e.g., providing at least one agent registry including capabilities of service providing electronic agents; interpreting a service request in the form of a base goal, the service request being in a interagent communication language (ICL), which in turn includes a layer of conversational protocol defined by event types and parameter lists associated with one or more of the events, wherein the Parameter lists further refine the one or more events; determining a plurality of sub goals necessary to accomplish the base goal; selecting from said registry at least one service providing agent capable of completing said sub goals; delegating at least one sub goal as a peer to peer service request directly from a service requesting agent to a service providing agent; and delegating any remaining sub goals as service request in the interagent communication language to the selected agents capable of completing the remaining sub-goals. This claim, as a whole, provides significant benefits and improvements discussed previously

that directly impact the capacity and functionality of the underlying computer software architecture, —for example an unprecedented ease to expand the agent based system with increased functionality without any need to revise code for the facilitator, the natural language agents, or any other client agents, as well as a significantly greater degree of freedom for users to use, and for the claimed system to accept and process an expanded set of more complex and compound requests and inquiries, relative to the prior art.

57. The above-disclosed and claimed process of claim 52 additionally constitutes an unconventional technical solution (for example, a process using a specialized interagent communication language with a unique conversation protocol layer defined by event types and parameter lists associated with one or more of the events, wherein the parameter lists further refine the one or more events) to address a technological problem rooted in computer technology of coordinating and completing tasks using service-providing electronic agents in a distributed computer environment.

#### Prosecution and Examination of the '560 Patent

58. The examination of the '560 Patent took more than seven years to complete, from the March 17, 1999 filing date of the patent application, to the June 27, 2006 issue date.

59. Two Patent Examiners were involved in examining the application that matured into the '560 Patent, namely, Examiner Lewis A. Bullock, Jr., and Supervisory Examiner John Follansbee.

60. Although the publicly available prosecution history of the '560 Patent does not contain the complete results of all patent examiner searches, it indicates that Examiner Bullock conducted prior art and/or other searches using at least the patent examiner systems Web-based Examiner Search Tool ("WEST") and Examiner

Automated Search Tool (“EAST”), and performed searches on at least December 4, 2002, November 11, 2003, and November 24, 2004. Certain summary results of the Examiner’s search dated November 24, 2004 indicate nine separate searches across seven databases, yielding a total of 1,785 hits. The Patent Examiners formally cited at least 10 separate references during the prosecution of the ’560 Patent.

61. Between the prior art references located by and cited by the Patent Examiners, and the references submitted by the applicants and considered by the Patent Examiners during the prosecution of the ’560 Patent, at least 33 patent references and 22 non-patent references were formally considered by the Patent Examiners, as indicated on the front two pages of the issued ’560 Patent.

62. On information and belief, it is the practice of the USPTO not to cite excessive cumulative art, in other words, in this instance, the art cited by the Patent Examiners is representative of considerable other art located by the USPTO and not cited. Further on information and belief, it is the practice of the USPTO to discuss in its Office Actions those references of which the Patent Examiners are aware that most closely resemble the claimed inventions.

63. On December 6, 2004, the USPTO issued a Notice of Allowance as to all of claims 1-55 presently in the ’560 Patent.

64. The issued claims from the ’115 Patent are patentably distinct from the at least 55 references identified and/or discussed during prosecution. That is, each of the 55 claims, as a whole—which include, e.g., at least one registry declaring capabilities of service-providing electronic agents, which use an interagent Communication Language (ICL) that includes a layer of conversational protocol defined by event types and

parameter lists associated with one or more of the events, wherein the parameter lists further refine the one or more events, and/or a facilitator agent, and/or a goal and plan that uses reasoning to determine sub-goal requests based on non-syntactic decomposition of the goal and uses the reasoning to co-ordinate and schedule efforts by the service-providing electronic agents to fulfill sub-goal requests in a cooperative completion of the goal—all were found to be patentably distinct from the at least 55 formally identified references.

65. The references cited during the examination of the '560 Patent all represent patentably distinct and in some instances prior art means or methods to achieve communication and coordination among distributed electronic agents. By allowing the claims of the '560 Patent, each of the claims in the '560 Patent, as a whole was shown to be inventive, novel, and innovative over at least the 55 formally identified references.

66. As each claim as a whole from the '115 Patent is inventive, novel, and innovative as compared to several specific patents and other publications, each claim, as a whole, constitutes more than the application of well-understood, routine, and conventional activities.

67. As of February 19, 2018, the '560 Patent has been cited as pertinent prior art by a USPTO examiner or an applicant during the prosecution of at least 188 issued patents and published applications—including during the prosecution of patent applications filed by leading technology companies such as Apple, IBM, Nuance Communications, Microsoft, and General Electric. Out of the 188 patent applications in which the '560 Patent was cited as pertinent prior art during prosecution, the USPTO has issued at least 152 patents.

68. The at least 188 forward citations to the '560 Patent—and at least 152 patents that have issued despite identification of the '560 Patent during their prosecution—reveal that the '560 Patent and its claimed inventions are directed to specific methods, systems, and programs for an improved software-based architecture for distributed electronic agents to communicate and cooperate, rather than merely disclosing an aspiration or result of that technology that would preempt the use of, or innovations in software-based architectures for distributed electronic agent communication and cooperation.

69. The '560 patent claims priority to January 5, 1999. The technology disclosed and claimed in the '560 Patent was not then well-understood, routine or conventional. To the contrary, the technology claimed in the '560 Patent was well ahead of the state of the art at the time of the invention. For example, every Office Action rejection during the entire prosecution of the application that issued as the '560 patent was entirely or partially based on publications where one or more inventors was an author or co-author of the reference.

**U.S. Patent No. 7,036,128**

70. IPA is the owner by assignment of U.S. Patent No. 7,036,128 (the “'128 patent”). The '128 Patent is entitled “Using a Community of Distributed Electronic Agents to Support a Highly Mobile Ambient Computing Environment.” The '128 Patent issued on April 25, 2006. A true and correct copy of the '128 Patent is attached hereto as **Exhibit F**.

71. The '128 Patent “is generally related to distributed computing environments and the completion of tasks within such environments . . . [and in particular] teaches a variety of software-based architectures for communication and

cooperation among distributed electronic agents to incorporate elements such as GPS or positioning agents and speech recognition into a highly mobile computing environment.”

’128 Patent at Col. 1, lines 19–26 (hereinafter 1:19–26).

72. The claimed inventions in the ’128 Patent are directed to new computer functionality and improvements to technological processes that address problems rooted in and arising from computer technology.

73. The ’128 Patent, at 1:5-12, states it is a continuation-in part of, and incorporates by reference U.S. Patent Application 09/225,198, filed January 5, 1999 (the parent application that issued as the ’115 Patent). The ’128 Patent also claims priority to and incorporates by reference provisional application nos. 60/124,718; 60/124,719; and 60/124,720.

74. As a continuation-in-part of the ’115 Patent discussed above, the specifications of the ’128 and ’115 Patents overlap significantly, and paragraphs 30-34 above regarding the specification of the ’115 Patent are incorporated by reference as if fully restated here in this section for the ’128 Patent.

75. The ’128 Patent discloses additional fundamental technological improvements to the underlying mobile computing environment:

The present invention provides a highly mobile, ambient computing environment for serving a knowledge worker away from their desk. The present invention allows a knowledge worker to obtain increased leverage from personal, networked, and interactive computing devices while on the move in their car, airplane seat, or in a conference room with other local or remote participants. ’128 Patent at 4:59-65.

76. The ’128 Patent contains four independent claims and 45 total claims, covering various methods, systems, and/or computer programs. Claim 1 states:

1. A collaborative computer-implemented community of distributed electronic agents, organized to provide a mobile computing environment, the computer-implemented community of distributed electronic agents comprising:

an agent registry wherein one or more capabilities of each of the electronic agents are registered in the form of an interagent communication language (ICL), wherein the interagent language includes a layer of conversational protocol defined by event types and parameter lists associated with one or more events, and wherein the parameter lists further refine the one or more events;

a facilitator agent arranged to coordinate cooperative task completion among the electronic agents by delegating one or more received ICL goals to a selected one or more of the electronic agents based upon the registered capabilities of the selected agents;

one or more service-providing electronic agents, being in bi-directional communication with the facilitator agent, including at least one location agent operable to ascertain a current physical location of a user; and

one or more computer interface agents being in bi-directional communication with the facilitator agent, the mobile computer interface agents being operable to process at least one mobile user input type and to responsively generate and present to the facilitator agent one or more ICL goals corresponding to the user's desired request.

77. The above-disclosed claim limitations from the '128 Patent comprise various elements, including, e.g., an agent registry wherein one or more capabilities of each of the electronic agents are registered in the form of an interagent communication language (ICL), which includes a layer of conversational protocol defined by event types and parameter lists associated with one or more events, and wherein the parameter lists further refine the one or more events; a facilitator agent arranged to coordinate cooperative task completion among the electronic agents by delegating one or more received ICL goals to a selected one or more of the electronic agents based upon the registered capabilities of the selected agents; one or more service-providing electronic agents, being in bi-directional communication with the facilitator agent, including at least



one location agent operable to ascertain a current physical location of a user; and one or more computer interface agents being in bi-directional communication with the facilitator agent, the mobile computer interface agents being operable to process at least one mobile user input type and to responsively generate and present to the facilitator agent one or more ICL goals corresponding to the user's desired request. This claim, as a whole, provides significant benefits and improvements discussed previously that directly impact the capacity and functionality of the underlying computer software architecture, for example an unprecedented ease to expand the agent based system with increased functionality without any need to revise code for the facilitator, the natural language agents, or any other client agents, as well as providing a significantly greater degree of freedom for users in a mobile environment to use, and for the claimed system to accept and process an expanded set of more complex and compound requests and inquiries, relative to the prior art.

78. The above-disclosed and claimed invention additionally constitutes an unconventional technical solution (for example, using a specialized interagent communication language with a unique conversational protocol layer defined by event types and parameter lists associated with one or more events, and wherein the parameter lists further refine the one or more events) to address a technological problem rooted in computer technology of coordinating and completing tasks using service-providing electronic agents in a mobile computer environment.

Prosecution and Examination of the '128 Patent

79. The examination of the '128 Patent took more than 5 and a half years, from the August 9, 2000 filing date of the patent application to its April 25, 2006 issue date.

80. The publicly available prosecution history for the '128 Patent indicates that a single patent examiner was involved in examining the application that matured into the '128 Patent, namely, Examiner Lewis A. Bullock, Jr.

81. Although the publicly available prosecution history of the '128 Patent does not contain the complete results of all patent examiner searches, it indicates that Examiner Bullock conducted prior art and/or other searches using one or more of the patent examiner systems Examiner Automated Search Tool ("EAST"), and databases of the European Patent Office (EPO), Japanese Patent Office (JPO), DERWENT, among others, on or around at least March 17, 2005; September 9, 2005; and December 12, 2005. Summary results of the Examiner's search dated March 19, 2005 indicate twenty-six separate searches across up to seven databases each, yielding a total of 1,435 hits. Summary results of the Examiner's search dated September 9, 2005 indicate 20 separate searches across up to seven databases each, yielding a total of 3,881 hits. Summary results of the Examiner's search dated December 12, 2005 indicate 56 separate searches across up to seven database each, yielding a total of 2,157 hits.

82. The Patent Examiner formally cited at least 22 separate references during the prosecution of the '128 Patent.

83. Between the prior art references located by and cited by the Patent Examiners, and the references submitted by the applicants and considered by the Patent Examiners during the prosecution of the '128 Patent, at least 41 patent references and 25

non-patent references were formally considered by the Patent Examiners, as indicated on the front two pages of the issued '128 Patent.

84. On information and belief, it is the practice of the USPTO not to cite excessive cumulative art, in other words, in this instance, the art cited by the Patent Examiners is representative of considerable other art located by the USPTO and not cited. Further on information and belief, it is the practice of the USPTO to discuss in its Office Actions those references of which the Patent Examiners are aware that most closely resemble the claimed inventions.

85. On September 14, 2005, the USPTO rejected the predecessor claims corresponding to present claims 1-21 and claim 45 for detailing “a collaborative community of distributed electronic agents that make up a mobile computing environment,” and that these “environments are software environments that are not tangible embodied and therefore non-statutory [subject-matter under 35 U.S.C. 101].” This confirms that the USPTO was analyzing and rejecting patent applications for compliance with statutory subject matter requirements under 35 U.S.C. 101.

86. On December 29, 2005, the USPTO issued a Notice of Allowance as to all of claims 1-45 presently in the '128 Patent.

87. The issued claims from the '128 Patent are patentably distinct from the at least 66 references identified and/or discussed during prosecution. That is, each of the 45 claims, as a whole—which include, e.g., distributed electronic agents in a mobile computing environment, wherein the one or more capabilities of the electronic agents are registered using an interagent communication language (ICL) that includes a layer of conversational protocol defined by event types and parameter lists associated with one or

more events, and wherein the parameter lists further refine the one or more events and/or a facilitator agent to coordinate cooperative task completion among the electronic agents, and/or a location agent to ascertain or provide user location information, and/or mobile computer interface to forward a user request for resource access to a facilitator agent and provide the user with such resource access—were found to be patentably distinct from at least these 66 formally identified references.

88. The references cited during the examination of the '128 Patent all represent patentably distinct and in some instances may constitute prior art means or methods for a mobile computing environment using distributed electronic agents. By allowing the claims of the '128 Patent, each of the claims in the '128 Patent, as a whole was shown to be inventive, novel, and innovative over at least the 66 formally identified references.

89. As each claim as a whole from the '128 Patent is inventive, novel, and innovative as compared to the specified patents and other publications, each claim, as a whole constitutes more than the application of well-understood, routine, and conventional activities.

90. As of February 19, 2018, the '128 Patent has been cited as pertinent prior art by a USPTO examiner or an applicant during the prosecution of at least 292 issued patents and published applications—including during the prosecution of patent applications filed by leading technology companies such as AT&T, IBM, Microsoft, Apple, and Google. Out of the 292 patent applications in which the '128 Patent was cited as pertinent prior art during prosecution, the USPTO has issued at least 225 patents.

91. The at least 292 forward citations to the '128 Patent—and the more than 225 patents that have issued despite identification of the '128 Patent during their prosecution—reveal that the '128 Patent and its claimed inventions are directed to specific methods, systems, and programs that improve communication and cooperation among distributed electronic agents in a mobile environment, rather than merely disclosing an aspiration or result of that technology that would preempt the use of, or innovations in mobile distributed electronic agent architectures.

92. The '128 patent claims priority to January 5, 1999. The technology disclosed and claimed in the '128 Patent was not then well-understood, routine or conventional. To the contrary, the technology claimed in the '128 Patent was well ahead of the state of the art at the time of the invention. For example, every Section 102 or 103 Office Action rejection during the entire prosecution of the application that issued as the '128 patent was entirely based on publications where one or more inventors was an author or co-author of the reference.

**U.S. Patent No. 6,742,021**

93. IPA is the owner by assignment of U.S. Patent No. 6,742,021 (the "'021 Patent"). The '021 Patent is entitled "Navigating Network-Based Electronic Information Using Spoken Input With Multimodal Error Feedback." The '021 Patent issued on May 25, 2004 from U.S. Patent application no. 09/524,095, filed March 13, 2000. A true and correct copy of the '021 Patent is attached as **Exhibit A to Plaintiff's Original Complaint**.

94. The '021 Patent is a continuation-in-part of U.S. Patent Application 09/225,198, and at Col. 1 lines 6-13, the '021 Patent claims priority to and incorporates

by reference the 09/225,198 application, as well as provisional application nos. 60/124,718; 60/124,719; and 60/124,720.

95. The '021 Patent “relates generally to the navigation of electronic data by means of spoken natural language requests, and to feedback mechanisms and methods for resolving the errors and ambiguities that may be associated with such request.” '021 Patent at Col. 1, lines 22-26 (hereinafter, 1:22-26).

96. The claimed inventions are directed to new computer functionality and improvements to technological processes that address problems rooted in and arising from computer technology.

97. The “Background of Invention” section of the '021 Patent states that as the universe of electronic data potentially available to users continues to expand, “there is a growing need for information navigation technology that allows relatively naïve users to navigate and access desired data by means of natural language input.” '021 Patent at 1:20-26.

98. For example, with the explosion of electronic content in important markets like home entertainment and mobile computing, the proliferation of high-bandwidth communications infrastructure enables delivery of movies and other interactive multimedia content. However, “for users to take full advantage of this content stream ultimately requires interactive navigation of content databases in a manner that is too complex for user-friendly selection by means of a traditional remote-control clicker.” '021 Patent at 1:28-36.

99. Allowing users to utilize spoken natural language requests to access electronic data provides the benefit of “rapidly searching and accessing desired content”

and “is an important objective” both for “successful consumer entertainment products,” that offer “a dizzying range of database content choices,” and “navigation of (and transaction with) relatively complex data warehouses,” when using “the Internet/Web or other networks for general information, multimedia content, or e-commerce transactions.” ’021 Patent at 1:37-46.

100. Then existing prior art “navigational systems for browsing electronic databases and data warehouses (search engines, menus, etc.) have been designed without navigation via spoken natural language as a specific goal,” and as a result the world was full of electronic data navigation systems that were not designed to be navigated with natural spoken commands, but assumed navigation with “text and mouse-click inputs (or in the case of TV remote controls, even less).” ’021 Patent at 1:47-54.

101. Prior art systems that simply recognized voice commands using an extremely limited vocabulary and grammar were insufficient, in part because such systems did not accept spoken inputs in a user-intuitive manner and required users to learn highly specialized command languages or formats. ’021 Patent at 1:54-64.

102. For example, prior art systems tended to require users to speak “in terms of arbitrary navigation structures (e.g., hierarchical layers of menus, commands, etc.) that are essentially artifacts reflecting constraints of the pre-existing text/click navigation system.” ’021 Patent at 1:59-2:3.

103. Moreover, the use of spoken natural language inputs for navigation of electronic data resources typically presented a variety of errors and ambiguities, such as garbled and unrecognized words, and under-constrained requests, that could not be resolved in a rapid, user-friendly, non-frustrating manner.

104. In addition, solutions to the prior art's limitations faced the problem that they needed to be compatible with the constraints imposed by multi-user, distributed environments such as the Internet and high-bandwidth content delivery networks, because a solution contemplating one-at-a-time user interaction at a single location would be insufficient.

105. The disclosed inventions, on the other hand, achieve a fundamental technological advance over the then-existing state of the art of navigating network-based electronic information because it enables "users to speak directly in terms of what the user wants—e.g., 'I'd like to see a Western film directed by Clint Eastwood' [.]'" '021 Patent at 1:64-67.

106. A further disclosed benefit of the inventions that improves the functioning of computer technology is that they can function as a voice interface on top (or on the front end) of a pre-existing non-voice navigational system, i.e., "a voice-driven front-end atop an existing, non-voice data navigation system, whereby users can interact by means of intuitive natural language input not strictly conforming to the step-by-step browsing architecture of the existing navigation system, and wherein any errors or ambiguities in user input are rapidly and conveniently resolved." '021 Patent at 2:13-19; 10:10-38.

107. One aspect of the inventions disclosed and claimed in the '021 Patent relates to formulating a navigation query after the system has interpreted the spoken request. For example, if responding to a user's interpreted request requires navigating a structured relational database, an embodiment of the invention could construct an appropriate Structured Query Language (SQL) query to select a relevant portion of that electronic data source.



108. The benefits of the inventions include not only increased convenience, but improvements to computer functionality and technological processes including increased efficiency and speed—and they achieve these technological benefits by fundamentally changing the manner in which a user interfaces and interacts with computer technology itself, as described in the following two examples:

It will be apparent, in light of the above teachings, that preferred embodiments of the present invention can provide a spoken natural language interface atop an existing, non-voice data navigation system, whereby users can interact by means of intuitive natural language input not strictly conforming to the linear browsing architecture or other artifacts of an existing menu/text/click navigation system. For example, users of an appropriate embodiment of the present invention for a video-on-demand application can directly speak the natural request: “Show me the movie ‘Unforgiven’”—instead of walking step-by-step through a typically linear sequence of genre/title/actor/director menus, scrolling and selecting from potentially long lists on each menu, or instead of being forced to use an alphanumeric keyboard that cannot be as comfortable to hold or use as a lightweight remote control. Similarly, users of an appropriate embodiment of the present invention for a web-surfing application in accordance with the process shown in FIG. 5 can directly speak the natural request: “Show me a one-month price chart for Microsoft stock”—instead of potentially having to navigate to an appropriate web site, search for the right ticker symbol, enter/select the symbol, and specify display of the desired one-month price chart, each of those steps potentially involving manual navigation and data entry to one or more different interaction screens.

’021 Patent at 10:10-38.

109. As the title of the ’021 Patent suggests, an important aspect of the inventions that improves computer technology itself is multi-modal error corrections and clarifications of the user’s spoken request when errors and ambiguities arise:

Instead of simply rejecting such input and defaulting to traditional input modes or simply asking the user to try again, a preferred embodiment of the present invention seeks to converge rapidly toward instantiation of a valid navigational template by soliciting additional clarification from the user as necessary,...via multimodal input, i.e., by means of menu selection or other input modalities...in addition to spoken input.

’021 Patent at 2:49-58.

110. The benefits of this multi-modal error correction/clarification are, as stated above, an accelerated instantiation of a valid navigational template, at least in part because the system is attempting new methods or means to obtain additional clarifying or necessary information that was not provided by a prior spoken request, and therefore avoids simply repeating a prior inquiry that was incomplete or otherwise erroneous. A further specified benefit is that “this clarifying, multi-modal dialogue takes advantage of whatever partial navigation information has been gleaned from the initial interpretation of the user’s spoken request.” ’021 Patent at 2:49-58.

111. The increased convenience, efficiency, accuracy, and speed improve the capacity of the navigation system as a whole. The improvements to the computer technology underlying the inventive spoken/natural language query for a database with multi-modal clarification versus prior art navigation systems are confirmed per the following example from the ’021 Patent:

Consider again the example in which the user of a video-on-demand application wishes to see “Unforgiven” but can only recall that it was directed by and starred Clint Eastwood. First, it bears noting that using a prior art navigational interface, such as a conventional menu interface, will likely be relatively tedious in this case. The user can proceed through a sequence of menus, such as Genre (select “western”), Title (skip), Actor (“Clint Eastwood”), and Director (“Clint Eastwood”). In each case—especially for the last two items—the user would typically scroll and select from fairly long lists in order to enter his or her desired name, or perhaps use a relatively couch-unfriendly keypad to manually type the actor's name twice.

Using a preferred embodiment of the present invention, the user instead speaks aloud, holding remote control microphone **102**, “I want to see that movie starring and directed by Clint Eastwood. Can’t remember the title.” At step **402** the voice data is received. At step **404** the voice data is interpreted. At step **405** an appropriate online data source is selected (or perhaps the system is directly connected to a proprietary video-on-demand provider). At step **406** a query is automatically constructed by the query construction logic **330** specifying “Clint

Eastwood” in both the actor and director fields. Step **407** detects no obvious problems, and so the query is electronically submitted and the data source is navigated at step **408**, yielding a list of several records satisfying the query (e.g., “Unforgiven”, “True Crime”, “Absolute Power”, etc.). Step **409** detects that additional user input is needed to further refine the query in order to select a particular film for viewing.

At that point, in step **412** query refinement logic **340** might preferably generate a display for client display device **112** showing the (relatively short) list of film titles that satisfy the user's stated constraints. The user can then preferably use a relatively convenient input modality, such as buttons on the remote control, to select the desired title from the menu. In a further preferred embodiment, the first title on the list is highlighted by default, so that the user can simply press an “OK” button to choose that selection.

’021 Patent at 11:24-62.

112. The ’021 Patent contains 8 independent claims, and a total of 132 claims, covering various methods, systems, and computer programs. Independent claim 1 is a method claim:

1. A method for speech-based navigation of an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, comprising the steps of:
  - (a) receiving a spoken request for desired information from the user;
  - (b) rendering an interpretation of the spoken request;
  - (c) constructing at least part of a navigation query based upon the interpretation;
  - (d) soliciting additional input from the user, including user interaction in a non-spoken modality different than the original request without requiring the user to request said non-spoken modality;
  - (e) refining the navigation query, based upon the additional input;
  - (f) using the refined navigation query to select a portion of the electronic data source; and
  - (g) transmitting the selected portion of the electronic data source from the network server to a client device of the user.

113. The above-claimed speech-based navigation method relies on, for example, receiving a spoken request, and performs multiple steps to interpret, construct, and refine a query of an electronic data source, and utilizes multi-modal functionality to obtain and use additional non-spoken input from a user without requiring the user to request said non-spoken modality, to transmit a portion of the electronic data source to a device of the user. Such claimed and disclosed navigation methods provide significant benefits and improvements to the capacity and underlying computer functionality over their prior art navigation methods—namely, increased speed, convenience, and efficiency in creating a proper query to search an electronic data source and providing information requested by a user, as well as a greater degree of freedom for users to use and the navigation system to accept and process an expanded set of intuitive inputs (e.g., natural language), rather than being limited solely to specialized command languages or formats that may require training or specialized knowledge to effectively use.

114. The above-disclosed and claimed speech-based navigation method additionally constitutes an unconventional technical solution (for example, multi-modal feedback to solicit additional user input, to refine and use an electronic data source query without requiring a user to request a non-spoken modality) to address a technical problem of electronic data source navigational methods to interpret, construct, query, and refine spoken requests.

#### Prosecution and Examination of the '021 Patent

115. The examination of the '021 Patent required more than four years, from the date of the filing of the patent application on March 13, 2000, through the issue date of May 25, 2004.

116. Four Patent Examiners were involved in examining the application that matured into the '021 Patent, namely, Assistant Examiner Firmin Backer and Supervisory Examiners Ayaz Sheikh, David Wiley, and James Trammel.

117. Although the results of various patent examiner searches are not summarized, the prosecution history of the '021 Patent indicates that Assistant Examiner Backer conducted prior art and other searches on several USPTO databases, including the patent examiner systems Web-based Examiner Search Tool ("WEST") at least on April 6, 2001; November 21, 2001; April 28, 2002; November 20, 2002; and November 21, 2002.

118. Between the prior art references located by and cited by the Patent Examiners, and the references submitted by the applicants and considered by the Patent Examiners during the prosecution of the '021 Patent, at least 25 patent references and 20 non-patent references were formally considered by the Patent Examiners, as indicated on the front two pages of the issued '021 Patent.

119. On information and belief, it is the practice of the USPTO not to cite excessive cumulative art, in other words, in this instance, the art cited by the Patent Examiners is representative of considerable other art located by the USPTO and not cited. Further on information and belief, it is the practice of the USPTO to discuss in its Office Actions those references of which the Patent Examiners are aware that most closely resemble the claimed inventions.

120. During prosecution of the application that matured into the '021 Patent, the U.S. Patent Office issued a Notice of Allowability on December 16, 2002, for claims

56-187 (i.e., issued claims 1-132), and in the “Examiner’s Reasons for Allowance,” stated, *inter alia*:

**Applicants teach an inventive concept** for navigating network-based electronic data sources in response to spoken natural language input request.

121. In order for the claims of the ’021 Patent to have issued, they needed to be patentably distinct from the at least 45 references formally identified and/or discussed during prosecution. That is, each of the claims, as a whole (e.g., methods, systems, and programs for speech-based electronic data source navigation that involve receiving a spoken request, interpreting that request, constructing, and refining a query of an electronic data source based on the interpretation and utilizing various aspects of multi-modal functionality to obtain and use additional non-spoken input from a user, to transmit a portion of the electronic data source to a device of the user) were found to be patentably distinct from these 45 formally identified references.

122. The references cited during the examination of the ’021 Patent all represent patentably distinct and in some instances prior art means or methods to navigate electronic data sources. By allowing the claims of the ’021 Patent, each of the claims in the ’021 Patent, as a whole was shown to be inventive, novel, and innovative.

123. As each claim as a whole of the ’021 Patent is inventive, novel, and innovative as compared to several specific patents and other publications, each claim as a whole constitutes more than the application of well-understood, routine, and conventional activities.

124. As of February 19, 2018, the ’021 Patent has been cited as pertinent prior art by a USPTO examiner or an applicant during the prosecution of at least 240 issued

patents and published applications—including during the prosecution of patent applications filed by leading technology companies such as Apple, IBM, Intel, and Google. Out of the 240 patent applications in which the '021 Patent was cited as pertinent prior art during prosecution, the USPTO issued more than 200 patents.

125. The at least 240 forward citations to the '021 Patent—and the more than 200 patents that have issued despite identification of the '021 Patent during their prosecution—reveal that the '021 Patent and its claimed inventions are directed to specific methods, systems, and programs that improve speech-based navigation of electronic databases, rather than merely disclosing an aspiration or result of that technology that would preempt the use of, or innovations in, speech-based navigation of electronic databases.

126. The '021 patent claims priority to January 5, 1999. The technology disclosed and claimed in the '021 Patent was not then well-understood, routine or conventional. To the contrary, the technology claimed in the '021 Patent was well ahead of the state of the art at the time of the invention. For example, Google was not even incorporated until September 1998 and had 39 employees in 1999. The first device widely acknowledged to be marketed as a “smartphone” was not announced until 2000 (Ericsson R380), which had a black and white display partially covered by a flip, users could not install their own software on the device, its architecture did not envisage users downloading their own applications, and it did not have WLAN, Bluetooth, or GPS capabilities. The first mobile camera phone did not come to this country until 2002 when Sprint offered the Sanyo SCP-5300. The first mobile device to offer email, texting, and a web browser was not released until 2003 (BlackBerry 6210). The first mobile phone with

any text to speech capability was not released until late 2004 (Samsung MM-A700), and it did not have the ability for speaker independent voice recognition because it did not use a network (that was not introduced on mobile phones until November 2008 with Google's voice recognition app for the iPhone). The first YouTube video uploaded April 2005, and the first mobile phone marketed as a phone to watch TV video was not announced until November 2005 (Nokia N92). The first mobile phone with capacitive touch screen not announced until January 2007 (LG Prada), which was also the same year the iPhone was released.

**U.S. Patent No. 6,523,061**

127. IPA is the owner by assignment of U.S. Patent No. 6,523,061 (the "061 Patent"). The '061 Patent is entitled "System, Method, and Article of Manufacture For Agent-Based Navigation in a Speech-Based Data Navigation System." The '061 Patent issued on February 18, 2003. A true and correct copy of the '061 Patent is attached hereto as **Exhibit B to Plaintiff's Original Complaint**.

128. The '061 Patent is a continuation of the '021 Patent discussed immediately above. The specifications of the '061 and '021 are therefore substantially identical, and paragraphs 97-108 above regarding the specification and state of the art at the time of the '021 are incorporated by reference as if fully restated here in this section for the '061 Patent.

129. The '061 Patent, at 1:6-19, claims priority to and incorporates by reference U.S. Patent Application 09/524,095 (The '021 Patent—even though the '061 issued out of order, prior to the '021 Patent), and U.S. Patent Application 09/225,198 (the grandparent to the '061 Patent, of which the '021 is a continuation-in-part). The '061



Patent also claims priority to and incorporates by reference the 09/225,198 application, as well as provisional application nos. 60/124,718; 60/124,719; and 60/124,720.

130. The specifications of both the '021 and '061 Patents disclose various software platforms that enable effective and dynamic collaboration of distributed electronic agents.

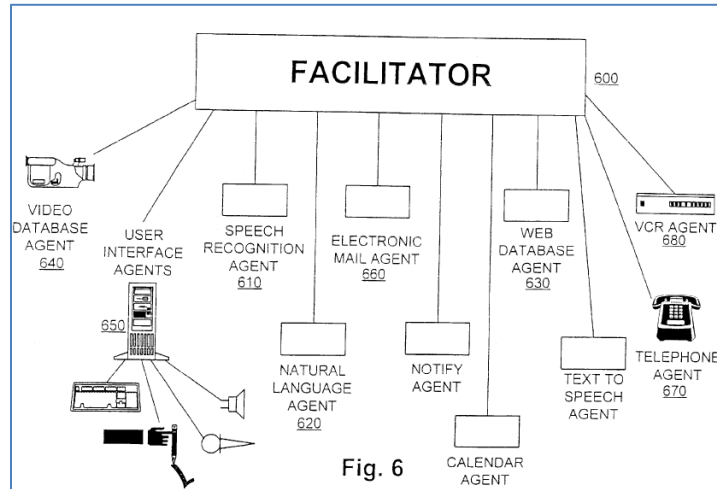
131. The claimed inventions in the '061 patent are directed to new computer functionality and improvements to technological processes that address problems rooted in and arising from computer technology.

132. A brief overview of the software platforms and certain improvements to the computer functionality and technological processes underlying the claimed speech-based navigation of electronic data sources is set forth in the specification:

[T]he functionality of each client agent is made available to the agent community through registration of the client agent's capabilities with a facilitator. **A software “wrapper” essentially surrounds the underlying application program performing the services offered by each client.** The common infrastructure for constructing agents is preferably supplied by an agent library. The agent library is preferably accessible in the runtime environment of several different programming languages. **The agent library preferably minimizes the effort required to construct a new system and maximizes the ease with which legacy systems can be “wrapped” and made compatible with the agent-based architecture of the present invention.** When invoked, a client agent makes a connection to a facilitator, which is known as its parent facilitator. Upon connection, an agent registers with its parent facilitator a specification of the capabilities and services it can provide, using a high level, declarative Interagent Communication Language (“ICL”) to express those capabilities. Tasks are presented to the facilitator in the form of ICL goal expressions. When a facilitator determines that the registered capabilities of one of its client agents will help satisfy a current goal or sub-goal thereof, the facilitator delegates that sub-goal to the client agent in the form of an ICL request. The client agent processes the request and returns answers or information to the facilitator. In processing a request, the client agent can use ICL to request services of other agents, or utilize other infrastructure services for collaborative work. The facilitator coordinates and integrates the results received from different client agents on various sub-goals, in order to satisfy the overall goal.

'061 Patent at 13:22-51. (Emphasis added).

133. As applied to the previous embodiments of the invention, but now through the lens of an agent platform, the specification states, referring to Figure 6, copied below:



For example, a representative application is now briefly presented, with reference to FIG. 6. If the statement “show me movies starring John Wayne” is spoken into the voice input device, the voice data for this request will be sent by UI agent 650 to facilitator 600, which in turn will ask natural language (NL) agent 620 and speech recognition agent 610 to interpret the query and return the interpretation in ICL format. The resulting ICL goal expression is then routed by the facilitator to appropriate agents—in this case, video-on-demand database agent 640—to execute the request. Video database agent 640 preferably includes or is coupled to an appropriate embodiment of query construction logic 330 and query refinement logic 340, and may also issue ICL requests to facilitator 600 for additional assistance—e.g., display of menus and capture of additional user input in the event that query refinement is needed—and facilitator 600 will delegate such requests to appropriate client agents in the community. When the desired video content is ultimately retrieved by video database agent 640, UI agent 650 is invoked by facilitator 600 to display the movie.

Other spoken user requests, such as a request for the current weather in New York City or for a stock quote, would eventually lead facilitator to invoke web database agent 630 to access the desired information from an appropriate Internet site. Here again, web database agent 630 preferably includes or is coupled to an appropriate embodiment of query construction logic 330 and query refinement logic 340, including a scraping utility.

'061 Patent at 14:25-55.

134. The '061 Patent contains three independent claims and eighteen total claims, covering various methods, systems, and computer programs. Claim 1 is a method claim:

1. A method for utilizing agents for speech-based navigation of an electronic data source, comprising the steps of:
  - (a) receiving a spoken request for desired information from a user;
  - (b) rendering an interpretation of the spoken request;
  - (c) constructing a navigation query based upon the interpretation;
  - (d) routing the navigation query to at least one agent, wherein the at least one agent utilizes the navigation query to select a portion of the electronic data source; and
  - (e) invoking a user interface agent for outputting the selected portion of the electronic data source to the user, wherein a facilitator manages data flow among multiple agents and maintains a registration of each of said agents' capabilities.

135. The above-disclosed and claimed speech-based navigation method relies on receiving a spoken request, interpreting the spoken request, constructing a navigation query based on the interpretation, routing the query to at least one agent that uses the query to select a portion of an electronic data source, an interface agent outputting the selected data source to a user, and a facilitator managing data flow among agents and maintaining a registration of each agent's capabilities. The claim, as a whole, provides solutions to the previously discussed technological problems, and achieves significant benefits and improvements to computer functionality and technological processes compared to prior art navigation methods—namely, increased speed, convenience, and efficiency in creating a proper query to search an electronic data source and providing information requested by a user, as well as a greater degree of freedom for users to use, and the navigation system to accept and process, an expanded set of intuitive inputs (e.g.,

natural language), rather than being limited solely to specialized command languages or formats that may require training or specialized knowledge to effectively use.

136. The above-disclosed and claimed agent and speech-based navigation method of the '061 Patent discloses software architectures that enhance the speech-based navigation method's capabilities and underlying computer functionality by minimizing "the effort required to construct a new system and maximiz[ing] the ease with which legacy systems can be "wrapped" and made compatible with the agent-based architecture of the present invention," and by the ease with which voice-based functionality can be added to new appliances by adding "service agents [that] can be plugged into the existing platform, immediately enabling the facilitator to respond dynamically to spoken natural language requests." ('061 Patent at 13:24-34; 14:25-55).

137. The above-disclosed and claimed speech-based navigation method of the '061 Patent discloses an unconventional technological solution (for example, an agent-based architecture using a facilitator to manage data flow among multiple agents and maintain a registration of each agents' capabilities) to address technological problems related to electronic data source navigational methods to interpret, construct, and query spoken requests.

#### Prosecution and Examination of the '061 Patent

138. The examination of the '061 Patent required more than two and a half years, from the date of the filing of the patent application on June 30, 2000, through the issue date of February 18, 2003.

139. Four Patent Examiners were involved in examining the application that matured into the '061 Patent, namely, Assistant Examiners Tammy Lee and Thu Ha Nguyen, and Supervisory Examiners Ayaz Sheikh and David Wiley.

140. Although the results of various patent examiner searches are not summarized, the prosecution history of the '061 Patent indicates that Assistant Examiner Thu Ha Nguyen conducted prior art and other searches using one or both of the patent examiner systems Web-based Examiner Search Tool ("WEST") and Examiner Automated Search Tool ("EAST") on at least July 30, 2001; February 6, 2002; May 23, 2002, and September 18, 2002. The Patent Examiners cited at least 13 separate references during the prosecution of the '061 Patent.

141. Between the prior art references located by and cited by the Patent Examiners, and the references submitted by the applicants and considered by the Patent Examiners during the prosecution of the '061 Patent, at least 30 patent references and 9 non-patent references were formally considered by the Patent Examiners, as indicated on the front two pages of the issued '061 Patent.

142. On information and belief, it is the practice of the USPTO not to cite excessive cumulative art, in other words, in this instance, the art cited by the Patent Examiners is representative of considerable other art located by the USPTO and not cited. Further on information and belief, it is the practice of the USPTO to discuss in its Office Actions those references of which the Patent Examiners are aware that most closely resemble the claimed inventions.

143. In order for the claims of the '061 Patent to have issued, they needed to be patentably distinct from the at least 39 references formally identified and/or discussed

during prosecution. That is, each of the claims, as a whole—e.g., e.g., methods, systems, and programs for speech-based navigation that comprise receiving a spoken request, interpreting the spoken request, constructing a navigation query based on the interpretation, routing the query to at least one agent that uses the query to select a portion of an electronic data source, and invoking an interface agent to output the selected data source to a user, wherein a facilitator manages data flow among agents and maintains a registration of each agent's capabilities—were found to be patentably distinct from at least these 39 identified references.

144. The references cited during the examination of the '061 Patent all represent patentably distinct and in some instances prior art means or methods to navigate electronic data sources. By allowing the claims of the '061 Patent, each of the claims in the '061 Patent, as a whole was shown to be inventive, novel, and innovative.

145. As each claim as a whole from the '061 Patent is inventive, novel, and innovative as compared to several specific patents and other publications, each claim as a whole, constitutes more than the application of well-understood, routine, and conventional activities.

146. As of February 19, 2018, the '061 Patent has been cited as pertinent prior art by a USPTO examiner or an applicant during the prosecution of approximately 350 issued U.S. patents and published applications, including during the prosecution of patent applications filed by leading technology companies such as AT&T, Apple, IBM, Motorola, Verizon, Sony, Amazon, Microsoft, and Google. Out of the approximately 350 patent applications in which the '061 Patent was cited as pertinent prior art during prosecution, the USPTO issued more than 225 patents.

147. The approximately 350 forward citations to the '061 Patent and more than 225 patents that have issued despite identification of the '061 Patent during their prosecution reveal that the '061 Patent and its claimed inventions are directed to specific improved methods, systems, and programs that use agents for speech-based navigation of electronic databases, rather than merely disclosing an aspiration or result of that technology that would preempt the use of, or innovations in, speech-based navigation of electronic databases.

148. The '061 patent claims priority to January 5, 1999. The technology disclosed and claimed in the '061 Patent was not then well-understood, routine or conventional. To the contrary, the technology claimed in the '061 Patent was well ahead of the state of the art at the time of the invention. For example, Google was not even incorporated until September 1998 and had 39 employees in 1999. The first device widely acknowledged to be marketed as a “smartphone” was not announced until 2000 (Ericsson R380), which had a black and white display partially covered by a flip, users could not install their own software on the device, its architecture did not envisage users downloading their own applications, and it did not have WLAN, Bluetooth, or GPS capabilities. The first mobile camera phone did not come to this country until 2002 when Sprint offered the Sanyo SCP-5300. The first mobile device to offer email, texting, and a web browser was not released until 2003 (BlackBerry 6210). The first mobile phone with any text to speech capability was not released until late 2004 (Samsung MM-A700), and it did not have the ability for speaker independent voice recognition because it did not use a network (that was not introduced on mobile phones until November 2008 with Google’s voice recognition app for the iPhone). The first YouTube video uploaded April

2005, and the first mobile phone marketed as a phone to watch TV video was not announced until November 2005 (Nokia N92). The first mobile phone with capacitive touch screen was not announced until January 2007 (LG Prada).

**U.S. Patent No. 6,757,718**

149. IPA is the owner by assignment of U.S. Patent No. 6,757,718 (the “’718 Patent”). The ’718 Patent is entitled “Mobile Navigation of Network-Based Electronic Information Using Spoken Input.” The ’718 Patent issued on June 29, 2004. A true and correct copy of the ’718 Patent is attached as **Exhibit C to Plaintiff’s Original Complaint**.

150. The ’718 Patent is a continuation of the ’021 Patent discussed above. The specifications of the ’718 and ’021 Patents are therefore substantially identical, and paragraphs 97-108 above regarding the specification and the state of the art of the ’021 are incorporated by reference as if fully restated here in this section for the ’718 Patent.

151. The ’718 Patent, at 1:5-18, claims priority to and incorporates by reference U.S. Patent Application 09/524,095 (the ’021 Patent), and U.S. Patent Application 09/225,198 (the grandparent to the ’718 Patent, of which the ’021 is a continuation-in-part). The ’718 Patent also claims priority to and incorporates by reference provisional application nos. 60/124,718; 60/124,719; and 60/124,720.

152. The claimed inventions in the ’718 patent are directed to new computer functionality and improvements to technological processes that address problems rooted in and arising from computer technology.

153. The ’718 Patent contains three independent claims and 27 total claims, covering various methods, systems, and computer programs. Claim 1 is a method claim:



1. A method for speech-based navigation of an electronic data source located at one or more network servers located remotely from a user, wherein a data link is established between a mobile information appliance of the user and the one or more network servers, comprising the steps of:

(a) receiving a spoken request for desired information from the user utilizing the mobile information appliance of the user, wherein said mobile information appliance comprises a portable remote control device or a set-top box for a television;

(b) rendering an interpretation of the spoken request;

(c) constructing a navigation query based upon the interpretation;

(d) utilizing the navigation query to select a portion of the electronic data source; and

(e) transmitting the selected portion of the electronic data source from the network server to the mobile information appliance of the user.

154. The above-disclosed and claimed speech-based navigation method of the '718 Patent comprises various elements, including establishing a data link between one or more remote network servers and a mobile information appliance of a user, receiving a spoken request from the user utilizing the mobile information appliance, which comprises a partial remote control device or set-top box for a television; rendering an interpretation of the spoken request, constructing a navigation query based on the interpretation, utilizing the query to select a portion of the electronic data source, and transmitting the portion of the data source from the network server to the mobile information appliance of the user. The claim, as a whole, provides significant benefits and improvements discussed previously that directly impact the capacity and underlying navigation computer functionality—namely, increased speed, convenience, and efficiency in creating a proper query to search an electronic data source and providing information requested by a user, as well as a greater degree of freedom for users to use, and for the navigation system to accept and process an expanded set of intuitive inputs (e.g., natural language), rather than

being limited solely to specialized command languages or formats that may require training or specialized knowledge to effectively use.

Prosecution and Examination of the '718 Patent

155. The examination of the '718 Patent required nearly four years, from the date of the filing of the patent application on June 30, 2000, through the issue date of June 29, 2004.

156. Four Patent Examiners were involved in examining the application that matured into the '061 Patent, namely, Assistant Examiners Firmin Backer and Frantz Jean, and Supervisory Examiners Ayaz Sheikh and David Wiley.

157. Although the complete results of various patent examiner searches are not summarized, the prosecution history of the '718 Patent indicates that Assistant Examiners Backer and Jean conducted prior art and other searches using one or more of the patent examiner search systems such as Web-based Examiner Search Tool ("WEST") databases of the European Patent Office (EPO), Japanese Patent Office (JPO), DERWENT, among others, on at least April 6, 2001; September 29, 2002; September 30, 2002; and March 7, 2003. The Patent Examiners cited at least six separate references during the prosecution of the '718 Patent.

158. Between the prior art references located by and cited by the Patent Examiners, and the references submitted by the applicants and considered by the Patent Examiners during the prosecution of the '718 Patent, at least 28 patent references and 8 non-patent references were formally considered by the Patent Examiners, as indicated on the front two pages of the issued '718 Patent.

159. On information and belief, it is the practice of the USPTO not to cite excessive cumulative art, in other words, in this instance, the art cited by the Patent

Examiners is representative of considerable other art located by the USPTO and not cited. Further on information and belief, it is the practice of the USPTO to discuss in its Office Actions those references of which the Patent Examiners are aware that most closely resemble the claimed inventions.

160. On March 7, 2003, the USPTO issued a Notice of Allowance, which included the following statement, *inter alia*:

The examiner respectfully submits that the specific techniques of providing a speech-based navigation where a spoken request for desired information is received from a user utilizing a mobile information appliance of the user, wherein the mobile information appliance comprises a portable remote control device or a set-top box for a television; in conjunction with the other limitations of the dependent and independent claims 56-82 were not shown by, would not have been obvious over, nor would have been fairly suggested by the prior art made of record.

161. The issued claims from the '718 Patent were patentably distinct from the at least 36 references identified and/or discussed during prosecution. That is, each of the 27 claims, as a whole—which include, e.g., electronic data navigation and establishing a data link between one or more remote network servers and a mobile information appliance of a user, receiving a spoken request from the user utilizing the mobile information appliance, which comprises a partial remote control device or set-top box for a television; rendering an interpretation of the spoken request, constructing a navigation query based on the interpretation, utilizing the query to select a portion of the electronic data source, and transmitting the portion of the data source from the network server to the mobile information appliance of the user—were found to be patentably distinct from at least these 36 formally identified references.

162. The references cited during the examination of the '718 Patent all represent patentably distinct and in some instances prior art means or methods to navigate

electronic data sources. By allowing the claims of the '718 Patent, each of the claims in the '718 Patent, as a whole was shown to be inventive, novel, and innovative over at least the 36 formally identified references.

163. As each claim as a whole from the '718 Patent is inventive, novel, and innovative as compared to several specific patents and other publications, each claim as a whole constitutes more than the application of well-understood, routine, and conventional activities.

164. As of February 19, 2018, the '718 Patent has been cited as pertinent prior art by a USPTO examiner or an applicant during the prosecution of at least 350 issued patents and published applications—including during the prosecution of patent applications filed by leading technology companies such as Apple, IBM, Intel, and Google. Out of the 350 patent applications in which the '718 Patent was cited as pertinent prior art during prosecution, the USPTO has issued more than 260 patents.

165. The at least 350 forward citations to the '718 Patent—and the more than 260 patents that have issued despite identification of the '718 Patent during their prosecution—reveal that the '718 Patent and its claimed inventions are directed to specific methods, systems, and programs that improve speech-based navigation of electronic databases, rather than merely disclosing an aspiration or result of that technology that would preempt the use of, or innovations in, speech-based navigation of electronic databases.

166. The '718 patent claims priority to January 5, 1999. The technology disclosed and claimed in the '718 Patent was not then well-understood, routine or conventional. To the contrary, the technology claimed in the '718 Patent was well ahead

of the state of the art at the time of the invention. For example, Google was not even incorporated until September 1998 and had 39 employees in 1999. The first device widely acknowledged to be marketed as a “smartphone” was not announced until 2000 (Ericsson R380), which had a black and white display partially covered by a flip, users could not install their own software on the device, its architecture did not envisage users downloading their own applications, and it did not have WLAN, Bluetooth, or GPS capabilities. The first mobile camera phone did not come to this country until 2002 when Sprint offered the Sanyo SCP-5300. The first mobile device to offer email, texting, and a web browser was not released until 2003 (BlackBerry 6210). The first mobile phone with any text to speech capability was not released until late 2004 (Samsung MM-A700), and it did not have the ability for speaker independent voice recognition because it did not use a network (that was not introduced on mobile phones until November 2008 with Google’s voice recognition app for the iPhone). The first YouTube video uploaded April 2005, and the first mobile phone marketed as a phone to watch TV video was not announced until November 2005 (Nokia N92). The first mobile phone with capacitive touch screen not announced until January 2007 (LG Prada), which was also the same year the iPhone was released.

### **OVERVIEW OF INFRINGING PRODUCTS**

167. Defendants make, market, and use methods, systems, and computer programs called Alexa, a “cloud-based voice service available on tens of millions of devices from Amazon and third-party device manufacturers.”<sup>1</sup>

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<sup>1</sup> <https://developer.amazon.com/alexa>

168. Alexa is incorporated into at least two types of Amazon-made products, the Amazon Echo line, including the Echo, the Echo Dot, the Echo Show, Echo Spot, Echo Plus, Echo Look, and Echo Connect (the “Echo Products”) and Amazon’s Fire TV, Fire TV Stick, Fire TV Gaming Edition, Fire tablet, and Fire HD tablet (the “Fire Products”).<sup>2</sup> A representation of the Alexa Platform is<sup>3</sup>:



169. Alexa is capable of performing skills, which Amazon has described as follows<sup>4</sup>:

<sup>2</sup>

[https://www.amazon.com/gp/help/customer/display.html/ref=amb\\_link\\_18?ie=UTF8&nodeId=201602230&pf\\_rd\\_m=ATVPDKIKX0DER&pf\\_rd\\_s=merchandised-search-leftnav&pf\\_rd\\_r=JWVVGVBHCK94KR29A5852&pf\\_rd\\_r=JWVVGVBHCK94KR29A5852&pf\\_rd\\_t=101&pf\\_rd\\_p=68125316-e5f7-413d-be3f-d0ee0c1e4f47&pf\\_rd\\_p=68125316-e5f7-413d-be3f-d0ee0c1e4f47&pf\\_rd\\_i=9818047011](https://www.amazon.com/gp/help/customer/display.html/ref=amb_link_18?ie=UTF8&nodeId=201602230&pf_rd_m=ATVPDKIKX0DER&pf_rd_s=merchandised-search-leftnav&pf_rd_r=JWVVGVBHCK94KR29A5852&pf_rd_r=JWVVGVBHCK94KR29A5852&pf_rd_t=101&pf_rd_p=68125316-e5f7-413d-be3f-d0ee0c1e4f47&pf_rd_p=68125316-e5f7-413d-be3f-d0ee0c1e4f47&pf_rd_i=9818047011)

<sup>3</sup> PowerPoint Presentation Entitled MBL310, Alexa Voice Service Under the Hood (October 2015).

<sup>4</sup> See Note 2.

**5. How do Alexa skills work?**

Skills are voice-driven Alexa capabilities. You can view available skills and enable or disable certain skills from your Alexa App, and start using enabled skills by saying specific phrase(s), called invocation names, after you activate Alexa. When you use a skill, we may exchange related information with the developer of that skill, such as your answers when you play a trivia skill, your ZIP code when you ask for the weather, or the content of your requests. The Skills portion of your Alexa App may contain more information about a skill, such as applicable policies or terms of use provided by the skill developer.

170. Amazon also provides detailed instructions, and hosting platforms, for third parties to develop Alexa Skills and host them on AWS Lambda<sup>5</sup>:

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<sup>5</sup> <https://developer.amazon.com/alexa-skills-kit/build>










## Build and Host Your Skill in the Cloud

Once you've designed your voice interaction, you're ready to start building your skill. Alexa is based in the cloud so she's always getting smarter and customers never have to download updates to your skill.

You can build and host most skills for free with [AWS Lambda](#), which is free for the first one million calls per month. You can also apply for [AWS promotional credits](#) if you incur AWS charges related to your skill.

### Build with the Alexa Skills Kit

Start building with the Alexa Skills Kit, a collection of self-service APIs, tools, documentation, and code samples that makes it fast and easy for anyone to add skills to Alexa.

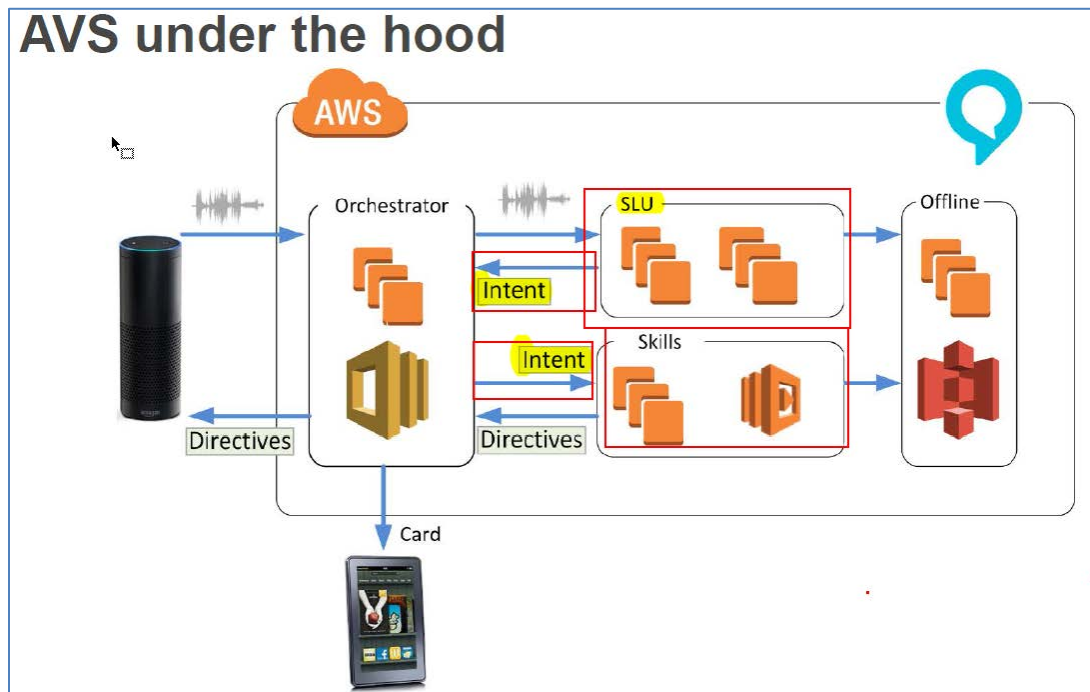
 <h4>Documentation</h4> <p>Refer to our technical documentation for detailed guides on building various types of skills and features.</p> <p><a href="#">Learn more</a></p>	 <h4>Node.js SDK and Code Samples</h4> <p>Take advantage of our Node.js SDK and code samples to quickly and easily add features to your skill for Alexa.</p> <p><a href="#">Learn more</a></p>	 <h4>Skill Management API</h4> <p>Programmatically manage and test your skills with this API and the ASK Command-line Interface (ASK CLI).</p> <p><a href="#">Learn more</a></p>
 <h4>Smart Home Skill API</h4> <p>Build skills that enable hands-free control of smart lights, thermostats, cameras, and entertainment devices.</p> <p><a href="#">Learn more</a></p>	 <h4>Video Skill API</h4> <p>Build experiences that allow your customers to easily find and consume video content without invoking a specific skill.</p> <p><a href="#">Learn more</a></p>	 <h4>Flash Briefing Skill API</h4> <p>Add feeds to the Alexa flash briefing, which delivers pre-recorded audio clips and text-to-speech (TTS) updates.</p> <p><a href="#">Learn more</a></p>
 <h4>List Skill API</h4> <p>Enable customers to manage their shopping and to-do lists, or create their own lists for any purpose or occasion.</p> <p><a href="#">Learn more</a></p>	 <h4>SSML</h4> <p>Add emotion to Alexa's responses. Control pronunciation, intonation, timing, and emotion.</p> <p><a href="#">Learn more</a></p>	 <h4>Alexa for Business APIs</h4> <p>Build and deploy skills featuring location-enabled context to automate administrative tasks for the workplace.</p> <p><a href="#">Learn more</a></p>

171. Further, Alexa utilizes machine learning technology, including Amazon Lex which is “service for building conversational interfaces into any application using voice and text” offered to third parties to build skills and apps for Alexa.<sup>6</sup>

<sup>6</sup> <https://aws.amazon.com/lex/>



172. According to documentations, Alexa’s voice service “AVS” exists in the cloud and includes an orchestrator, an SLU for language recognition, and several skills agents<sup>7</sup>:



173. According to the “AVS under the hood” slide, the Alexa Platform product receives audio and passes the audio to the SLU, which returns intents. The Orchestrator then passes the intents to relevant skills, and the skills return any necessary directives, which are then passed to the Alexa Platform product.

174. The capabilities, which Amazon calls Alexa’s Skills, come from both Amazon and from third parties, who may use Amazon’s Alexa Skills Kit to add additional skills to Alexa<sup>8</sup>:

<sup>7</sup> PowerPoint Presentation Entitled MBL310, Alexa Voice Service Under the Hood (October 2015).

<sup>8</sup> <https://developer.amazon.com/alexa>; <https://developer.amazon.com/alexa-skills-kit>.



## Add Capabilities to Alexa

Add capabilities, or skills, to Alexa using the Alexa Skills Kit (ASK), a collection of self-service APIs, tools, documentation, and code samples. Skills make Alexa smarter and enable customers to do more with voice. Build natural, voice-first experiences with our toolkit, and help redefine the way your customers interact with technology.

Learn more: [Alexa Skills Kit](#)

## What Is an Alexa Skill?

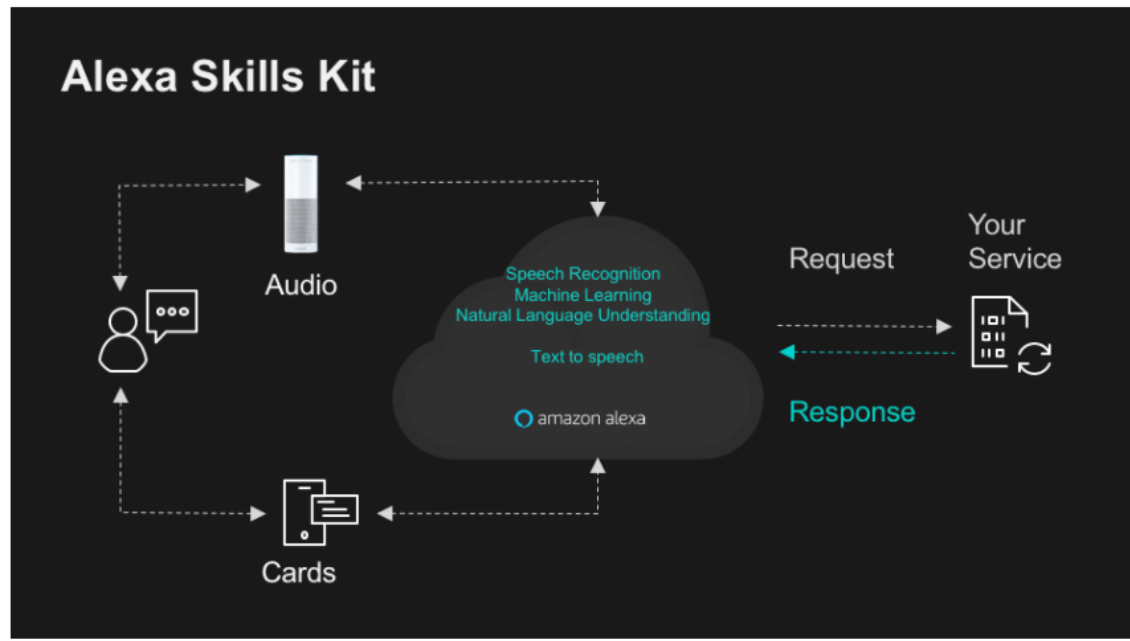
Alexa is Amazon's voice service and the brain behind tens of millions of devices like the Echo family of devices including [Echo Show](#) and [Echo Spot](#). Alexa provides capabilities, or skills, that enable customers to create a more personalized experience. There are now [tens of thousands of skills](#) from companies like Starbucks, Uber, and Capital One as well as other innovative designers and developers.

175. Whenever a user interacts with a skill, Alexa sends a JSON request, which is the “protocol interface between the Alexa service and the web service or Lambda function.”<sup>9</sup>

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<sup>9</sup> <https://developer.amazon.com/docs/custom-skills/request-and-response-json-reference.html>; <https://developer.amazon.com/blogs/alexa/post/1c9f0651-6f67-415d-baa2-542ebc0a84cc/build-engaging-skills-what-s-inside-the-alexa-json-request>.

Today we're taking a deep dive into the JSON requests sent to your service each time a user interacts with your skill. Since our technical documentation provides an incredible reference for this JSON file, this post won't focus as much on the implementation details. Instead, we're going to highlight how you can use JSON requests to enhance your skills for your customers. But before we get into the specifics, here's an overview of the entire pipeline that creates this JSON for your skill.



## Request and Response JSON Reference

The Alexa Skills Kit enables you to give Alexa new abilities by building a cloud-based service. This service can be either a web service or an [AWS Lambda](#) function. This document details the protocol interface between the Alexa service and the web service or Lambda function you create. AWS Lambda is a service offering by [Amazon Web Services](#).

Alexa communicates with your service via a request-response mechanism using [HTTP](#) over [SSL/TLS](#). When a user interacts with an Alexa skill, your service receives a [POST](#) request containing a JSON body. The request body contains the parameters necessary for the service to perform its logic and generate a JSON-formatted response.

176. For some skills, including custom skills, Alexa requires a known schema of intents, utterances, and slot types, which implements the logic for the skill. These mappings are<sup>10</sup>:

<sup>10</sup> <https://developer.amazon.com/docs/custom-skills/create-the-interaction-model-for-your-skill.html>.

1. **Intents:** An *intent* represents an action that fulfills a user's spoken request. Intents can optionally have arguments called *slots*.
  2. **Sample utterances:** A set of likely spoken phrases mapped to the intents. This should include as many representative phrases as possible.
  3. **Custom slot types:** A representative list of possible values for a slot. Custom slot types are used for lists of items that are not covered by one of Amazon's built-in slot types.
  4. **Dialog model** (optional): A structure that identifies the steps for a *multi-turn conversation* between your skill and the user to collect all the information needed to fulfill each intent. This simplifies the code you need to write to ask the user for information.
- This document defines these components and explains how to create them within developer console beta.

177. Other skills that a third party can develop or may be implemented natively within Alexa utilize various APIs, such as Smart Home Skills, Video Skills, Flash briefing Skills, and List Skills.<sup>11</sup>

178. All Skills, however, must be registered with Alexa in the Developer Portal and be configured to communicate via OAuth 2.0. Other examples of schemas Amazon mandates for interaction with Alexa include the Skill Manifest<sup>12</sup>, the Alexa Skill Management API<sup>13</sup>, and the Interaction Model Schema<sup>14</sup>.

179. As stated above, Amazon manufactures, sells, and supports numerous Alexa-enabled Products, including the Echo Products and the Fire Products. Generally, the Echo Products are natural language input devices that provide an interface to Alexa and also allow for the interface with several third party applications, such as smart home devices and for ordering products on Amazon. The Fire Products are generally multimedia content delivery hardware products that utilize Alexa for voice-activated goal task completion of Skills that Alexa can task to the Fire Products.

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<sup>11</sup> <https://developer.amazon.com/docs/custom-skills/create-the-interaction-model-for-your-skill.html>.

<sup>12</sup> <https://developer.amazon.com/docs/smapi/skill-manifest.html>.

<sup>13</sup> <https://developer.amazon.com/docs/smapi/ask-cli-intro.html>.

<sup>14</sup> <https://developer.amazon.com/docs/smapi/interaction-model-schema.html>.

**COUNT I**  
**(Infringement of U.S. Patent No. 6,851,115)**

180. Plaintiff re-alleges and incorporates by reference the allegations in the foregoing paragraphs as if fully set forth herein.

181. Plaintiff is informed and believes, and on that basis alleges, that Defendants have infringed and are currently infringing one or more claims (*e.g.*, claim 61) of the '115 Patent, in violation of 35 U.S.C. § 271.

182. Defendants have infringed and are currently infringing literally and/or under the doctrine of equivalents, by, among other things, making, using, offering for sale, selling, and/or importing within this judicial district and elsewhere in the United States, without license or authority, infringing products, including but not limited to Amazon Alexa, the Echo Products, the Fire Products and related products and/or processes falling within the scope of one or more claims of the '115 Patent, including claim 61:

61. A facilitator agent arranged to coordinate cooperative task completion within a distributed computing environment having a plurality of autonomous service-providing electronic agents, the facilitator agent comprising:

an agent registry that declares capabilities of service-providing electronic agents currently active within the distributed computing environment; and

a facilitating engine operable to parse a service requesting order to interpret a compound goal set forth therein, the compound goal including both local and global constraints and control parameters, the service request formed according to an Interagent Communication Language (ICL), wherein the ICL includes:

a layer of conversational protocol defined by event types and parameter lists associated with one or more of the events, wherein the parameter lists further refine the one or more events; and

a content layer comprising one or more of goals, triggers and data elements associated with the events; and

the facilitating engine further operable to construct a goal satisfaction plan by using reasoning that includes one or more of domain-independent coordination strategies, domain-specific reasoning, and application-specific reasoning comprising rules and learning algorithms.

183. Defendants' acts of making, using, offering for sale, selling, and/or importing infringing products, including but not limited to Amazon Alexa, the Echo Products, the Fire Products and related products and/or processes satisfy, literally or under the doctrine of equivalents, each and every claim limitation, including but not limited to limitations of claim 61.<sup>15</sup>

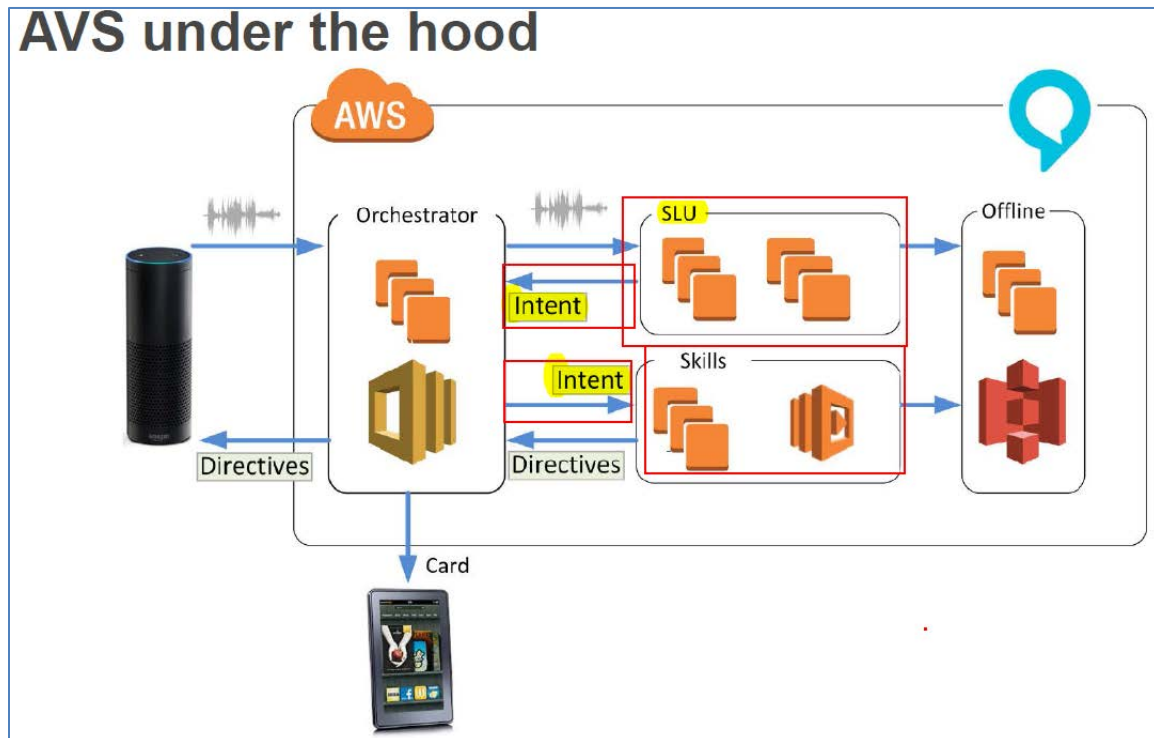
184. Defendants directly infringe claim 61 by making, using, offering for sale, selling, and/or importing the claimed facilitator agent, and/or by putting the claimed facilitator agent as a whole into service, and/or by controlling the claimed facilitator agent as a whole and benefiting from each element of the claimed facilitator agent. Defendant controls the facilitator agent as a whole by making, using, offering for sale, selling, and or importing a facilitator agent or dictating, under strict controls and processes, the structure and function of agent registries, a facilitating engine able to parse service requests to incorporate compound goals and construct goal satisfaction plans in accordance with the claims, and a conversational protocol consisting of both a conversational layer and a content layer through various SDKs, schemas, and programming requirements for all aspects of the Amazon's cloud services such as AWS and AVS, as further explained below. Further, Defendant benefits from each element of

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<sup>15</sup> Plaintiff expressly reserves the right to identify additional asserted claims in its infringement contentions in accordance with the local patent rules. Claim 61 is provided for notice pleading only and is not presented as an "exemplary" claim of all other claims in the '115 patent.

the claimed facilitator agent by ensuring consistency and interactivity between facilitator agents and with the remainder of the computing environment.

185. For example, Defendants' Alexa uses a facilitator agent to coordinate cooperate task completion within a distributed computing environment, as described on Alexa Voice Service Under the Hood October 2015 presentation:<sup>16</sup>

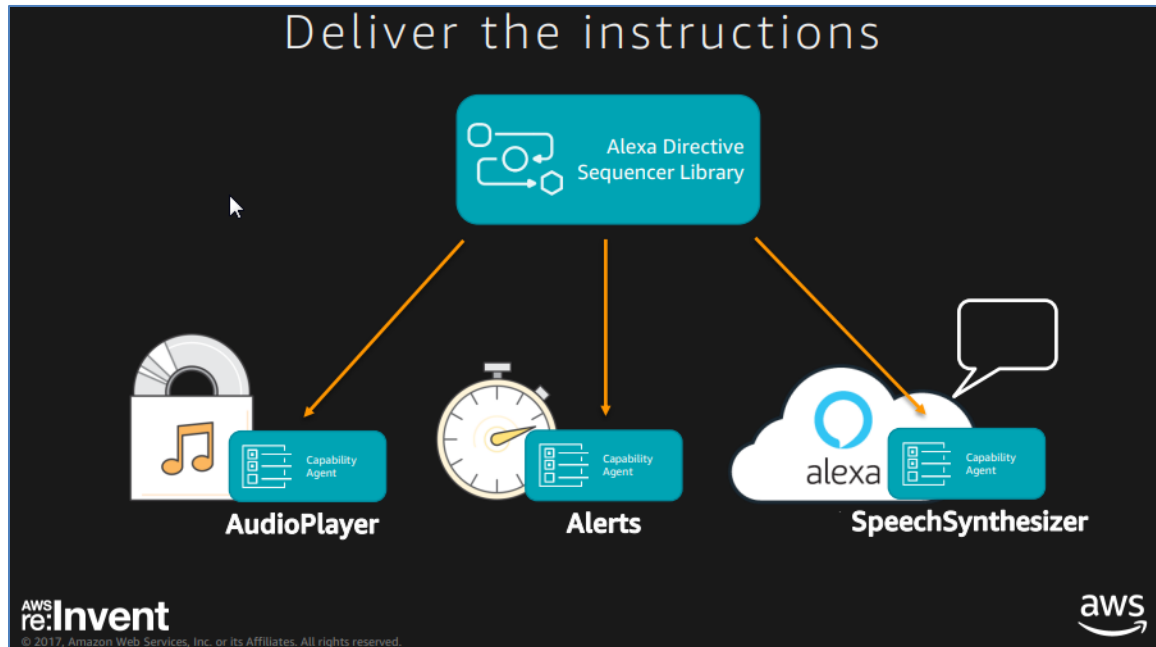


186. This query by the Orchestrator to the Skills based on the Intent is an example where Alexa looks to a registry that includes capabilities of service-providing electronic agents, for example agents built by third parties as apps. All Skills, however, must be registered with Alexa in the Developer Portal and be configured to communicate via OAuth 2.0. Other examples of schemas Amazon mandates for interaction with Alexa

<sup>16</sup> PowerPoint Presentation Entitled MBL310, Alexa Voice Service Under the Hood (October 2015).

include the Skill Manifest<sup>17</sup>, the Alexa Skill Management API<sup>18</sup>, and the Interaction Model Schema<sup>19</sup>

187. Alexa also includes various “capability agents” such as AudioPlayer, Alerts, and SpeechSynthesizer, that are part of the core product, and receive instructions from the Alexa Directive Sequencer Library<sup>20</sup>:



188. A facilitator agent is able to parse a service requesting order to interpret a compound goal set forth within the request, where the request is formed according to an ICL. For Example, Alexa, via an orchestrator, sends a voice clip to the SLU, which returns Intents for the user.<sup>21</sup> The orchestrator then processes those requests to send to

<sup>17</sup> <https://developer.amazon.com/docs/smapi/skill-manifest.html>.

<sup>18</sup> <https://developer.amazon.com/docs/smapi/ask-cli-intro.html>.

<sup>19</sup> <https://developer.amazon.com/docs/smapi/interaction-model-schema.html>.

<sup>20</sup> Integrate Alexa Voice Technology Into Your Product with the Alexa Voice Service, AWS re:INVENT 2017, Travis Grizzel (2017).

<sup>21</sup> PowerPoint Presentation Entitled MBL310, Alexa Voice Service Under the Hood (October 2015).



various Skills. The interaction between orchestrator and Skill is delivered through a highly structured JSON schema, which Amazon describes as the protocol interface between the Alexa Service and the Skill (hosted as either a web service or Lambda function—a service offered by Amazon Web Services.<sup>22</sup>

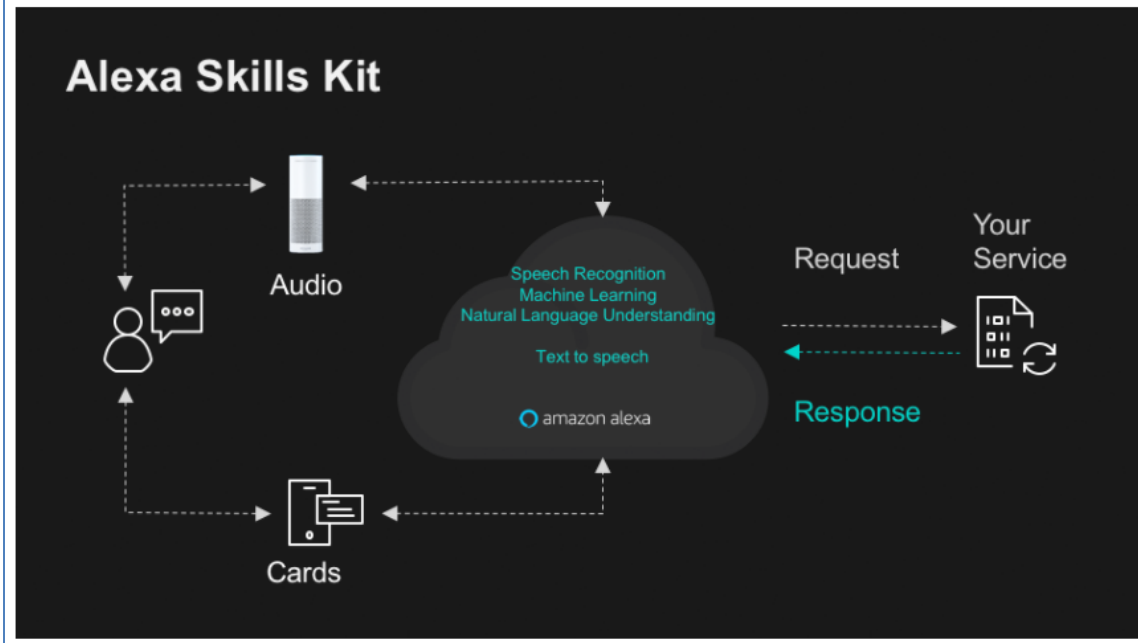
189. Alexa uses an ICL that includes both a conversational protocol layer composed of event types and parameters, as well as a content layer that is comprised of one or more goals, triggers, and data elements associated with the events. A non-limiting example of such communication is disclosed, which at least in some instances is described as Intents, utterances, and slots, which are communicated through a highly structured JSON schema<sup>23</sup>:

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<sup>22</sup> <https://developer.amazon.com/docs/custom-skills/request-and-response-json-reference.html>; <https://developer.amazon.com/blogs/alexa/post/1c9f0651-6f67-415d-baa2-542ebc0a84cc/build-engaging-skills-what-s-inside-the-alexa-json-request>.

<sup>23</sup> <https://developer.amazon.com/blogs/alexa/post/1c9f0651-6f67-415d-baa2-542ebc0a84cc/build-engaging-skills-what-s-inside-the-alexa-json-request>.

Today we're taking a deep dive into the JSON requests sent to your service each time a user interacts with your skill. Since our technical documentation provides an incredible reference for this JSON file, this post won't focus as much on the implementation details. Instead, we're going to highlight how you can use JSON requests to enhance your skills for your customers. But before we get into the specifics, here's an overview of the entire pipeline that creates this JSON for your skill.



190. For example, certain phrases, which Alexa refers to as Intents, include event types, and those event types further have a list of parameters that refine those events:<sup>24</sup>

1. **Intents:** An *intent* represents an action that fulfills a user's spoken request. Intents can optionally have arguments called *slots*.
2. **Sample utterances:** A set of likely spoken phrases mapped to the intents. This should include as many representative phrases as possible.
3. **Custom slot types:** A representative list of possible values for a slot. Custom slot types are used for lists of items that are not covered by one of Amazon's built-in slot types.
4. **Dialog model** (optional): A structure that identifies the steps for a *multi-turn conversation* between your skill and the user to collect all the information needed to fulfill each intent. This simplifies the code you need to write to ask the user for information.

This document defines these components and explains how to create them within developer console beta.

<sup>24</sup> <https://developer.amazon.com/docs/custom-skills/create-the-interaction-model-for-your-skill.html>.

191. Additionally, for built-in Intents created by Amazon, there is a further example of the Intent signature that third parties can also use in developing Skills for Alexa, which further illustrates an ICL:<sup>25</sup>



192. As discussed above, the facilitating engine constructs a goal satisfaction plan that includes reasoning that includes one or more of domain-independent coordination strategies, domain-specific reasoning, and application-specific reasoning comprising rules and learning algorithms. For example, as part of an AVS request, the orchestrator sends the audio clip to the SLU, which then compares against intent schema to parse the request, handle slot filling, and then transmit the Intent request to a Skill.

<sup>25</sup> <https://developer.amazon.com/docs/custom-skills/built-in-intent-library.html>.

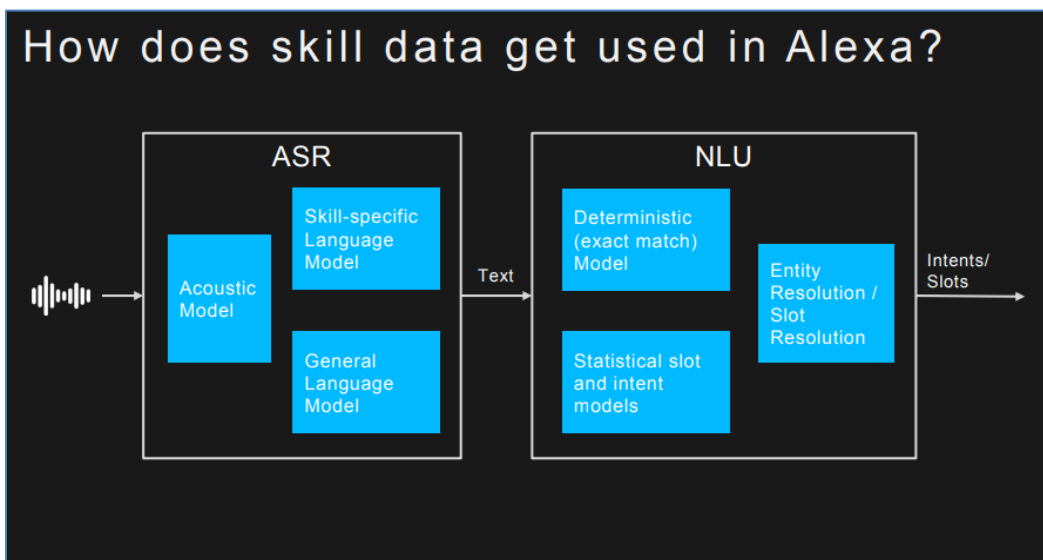
This process, for both third party and Amazon-created skill uses machine learning technologies to recognize the intent of the text (or speech)<sup>26</sup>:

Amazon Lex is a service for building conversational interfaces into any application using voice and text. Amazon Lex provides the advanced deep learning functionalities of automatic speech recognition (ASR) for converting speech to text, and natural language understanding (NLU) to recognize the intent of the text, to enable you to build applications with highly engaging user experiences and lifelike conversational interactions. With Amazon Lex, the same deep learning technologies that power Amazon Alexa are now available to any developer, enabling you to quickly and easily build sophisticated, natural language, conversational bots ("chatbots").

Speech recognition and natural language understanding are some of the most challenging problems to solve in computer science, requiring sophisticated deep learning algorithms to be trained on massive amounts of data and infrastructure. Amazon Lex democratizes these deep learning technologies by putting the power of Amazon Alexa within reach of all developers. Harnessing these technologies, Amazon Lex enables you to define entirely new categories of products made possible through conversational interfaces.

As a fully managed service, Amazon Lex scales automatically, so you don't need to worry about managing infrastructure. With Amazon Lex, you pay only for what you use. There are no upfront commitments or minimum fees.

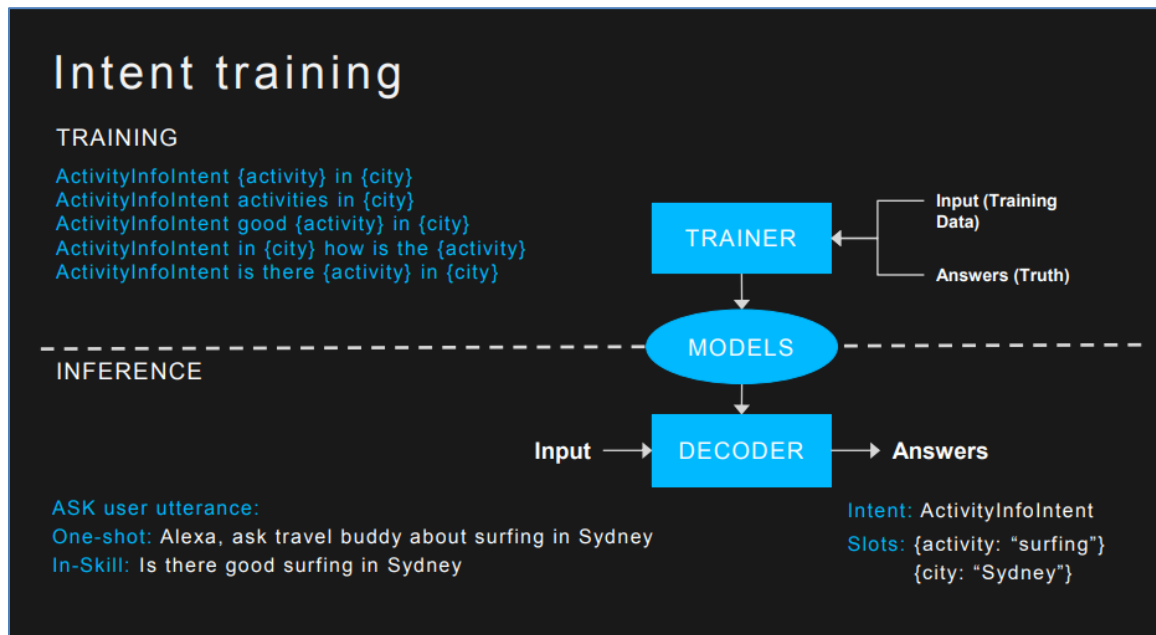
193. By using the skill data, the NLU completes Entity and Slot resolution<sup>27</sup>:



<sup>26</sup> <https://aws.amazon.com/lex/>.

<sup>27</sup> AWS re:Invent ALX319, It's All in the Data, The Machine Learning Behind Alexa's AI Systems, by Rajiv Reddy (November 28, 2017).

194. Further, through training and inference, Alexa may apply trainer examples to identify Intents and Slots<sup>28</sup>:



195. Defendants have also infringed indirectly and continue to infringe indirectly the '115 Patent by active inducement under 35 U.S.C. § 271(b).

196. On information and belief, Defendants have intended, and continue to intend, to induce patent infringement by its users and have had knowledge that the inducing acts would cause infringement or has been willfully blind to the possibility that its inducing acts would cause infringement.

197. For example, Defendants encouraged end users to use a computer-implemented method for communication and cooperative task completion among a plurality of distributed electronic agents using the method as claimed in claim 61 of the '115 Patent through the very nature of the products.

<sup>28</sup> AWS re:Invent ALX319, It's All in the Data, The Machine Learning Behind Alexa's AI Systems, by Rajiv Reddy (November 28, 2017).

198. As a further example, Defendants instruct users on how to use the infringing products for a computer-implemented method for communication and cooperative task completion among a plurality of distributed electronic agents using a method as claimed in claim 61 of the '115 Patent. By using the infringing products to perform a computer-implemented method for communication and cooperative task completion among a plurality of distributed electronic agents, users directly infringe at least claim 61 of the '115 Patent. By continuing to provide instructions to users on how to use the infringing products to perform a computer-implemented method for communication and cooperative task completion among a plurality of distributed electronic agents as claimed in claim 61 of the '115 Patent, and by continuing to encourage such use, Defendants have and continue to specifically intend to induce infringement of the '115 Patent.

199. Defendants have also infringed indirectly and continue to infringe indirectly the '115 Patent by contributory infringement under 35 U.S.C. § 271(c).

200. Defendants have and continue to intentionally commit contributory infringement by selling, offering to sell, or importing the infringing products, which include non-standard software that has no substantial non-infringing use, including but not limited to Amazon Alexa, which will be used by users with, for example, the Alexa SDK and development platform app to directly infringe at least claim 61 of the '115 patent.

201. Since at least March 12, 2018, when Defendants first received a copy of the proposed First Amended Complaint, Defendants have been and still are willfully infringing the '115 Patent. On information and belief, at least as early as March 12,

2018, Defendants had actual knowledge of the '115 Patent. Despite having actual knowledge of the '115 Patent, Defendants have continued to willfully, wantonly, and deliberately infringe the '115 Patent. Accordingly, Plaintiff seeks enhanced damages pursuant to 35 U.S.C. § 284 and a finding that this is an exceptional case within the meaning of 35 U.S.C. § 285, entitling Plaintiff to its attorneys' fees and expenses.

202. To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '115 Patent.

203. As a result of Defendants' infringement of the '115 Patent, Plaintiff has been injured by Defendants' unauthorized use of Plaintiff's intellectual property. Plaintiff seeks monetary damages in an amount adequate to compensate for Defendants' infringement, but in no event less than a reasonable royalty for the use made of the invention by Defendants, together with interest and costs as fixed by the Court, and Plaintiff will continue to suffer damages in the future unless Defendant's infringing activities are enjoined by this Court.

204. Unless a permanent injunction is issued enjoining Defendants and its agents, servants, employees, representatives, affiliates, and all others acting or in active concert therewith from infringing the '115 Patent, Plaintiff will be greatly and irreparably harmed.

**COUNT II**  
**(Infringement of U.S. Patent No. 7,069,560)**

205. Plaintiff re-alleges and incorporates by reference the allegations in the foregoing paragraphs as if fully set forth herein.

206. Plaintiff is informed and believes, and on that basis alleges, that Defendants have infringed and are currently infringing one or more claims (e.g., claim 52) of the '560 Patent, in violation of 35 U.S.C. § 271.

207. Defendants have infringed and are currently infringing literally and/or under the doctrine of equivalents, by, among other things, making, using, offering for sale, selling, and/or importing within this judicial district and elsewhere in the United States, without license or authority, infringing products, including but not limited to Amazon Alexa, the Echo Products, the Fire Products and related products and/or processes falling within the scope of one or more claims of the '560 Patent, including claim 52:

52. A computer implemented process for providing coordinated task completion within a distributed computing environment, the distributed computing environment including a plurality of autonomous electronic agents, the computer implemented method comprising the steps of:

- providing at least one agent registry including capabilities of service providing electronic agents;

- interpreting a service request in the form of a base goal, the service request being in a interagent communication language (ICL), the ICL including a layer of conversational protocol defined by event types and parameter lists associated with one or more of the events, wherein the Parameter lists further refine the one or more events;

- determining a plurality of sub goals necessary to accomplish the base goal; selecting from said registry at least one service providing agent capable of completing said sub goals;

- delegating at least one sub goal as a peer to peer service request directly from a service requesting agent to a service providing agent; and

- delegating any remaining sub goals as service request in the interagent communication language to the selected agents capable of completing the remaining sub-goals.



208. Defendants' acts of making, using, offering for sale, selling, and/or importing infringing products, including but not limited to Amazon Alexa, the Echo Products, the Fire Products and related products and/or processes satisfy, literally or under the doctrine of equivalents, each and every claim limitation, including but not limited to limitations of claim 52.<sup>29</sup>

209. Defendants directly infringe claim 52 by performing each step of the method itself, and for any step they do not themselves perform, by directing or controlling the performance of such steps by third-parties including app developers and device manufacturers when those third-parties develop services for integration into Amazon Alexa, by conditioning participation in an activity of a benefit upon performance of a step or steps of the patented method and establishes such that the performance of such steps is attributable to Defendants, including without limitation based on Defendants' instructions, requirements to use Defendants' development platforms, and various Amazon Developer Agreements. Defendants further directly infringe claim 52 when it tests Amazon Alexa, the Echo Products, and the Fire Products.

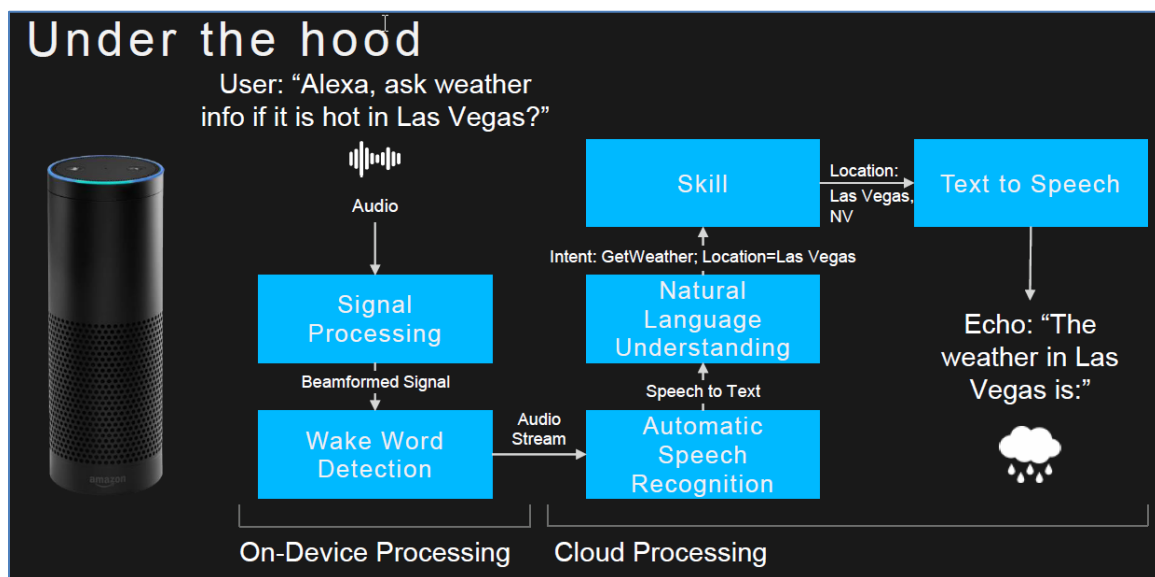
210. For example, Defendants' Alexa uses a process for providing coordinated task planning and execution within a distributed computing environment. Alexa contemplates the use of (1) an agent registry including capabilities of service providing electronic agents, (2) interpreting a service request in the form of a base goal, which is communicated with an ICL that includes a conversational protocol layer defined by event

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<sup>29</sup> Plaintiff expressly reserves the right to identify additional asserted claims in its infringement contentions in accordance with the local patent rules. Claim 52 is provided for notice pleading only and is not presented as an "exemplary" claim of all other claims in the '560 patent

types and parameter lists associated with the event type (3) determining sub-goals necessary to accomplish the base goal, and then selecting an agent to complete the sub goal, and delegating the sub goal as a peer to peer service directly from the service requesting agent to the service providing agent, and delegating any remaining subgoals to selected agents capable of completing the remaining subgoals.

211. As an example, Alexa uses the claimed method when a user asks, for example, if the weather is hot in Las Vegas and Alexa responds with information regarding Las Vegas weather<sup>30</sup>:



212. First, Alexa has an agent registry that includes capabilities of service providing agents, and for selecting from the registry at least one service providing agent capable of completing a sub goal. All Skills must be registered with Alexa in the Developer Portal and be configured to communicate via OAuth 2.0. Further, Alexa

<sup>30</sup> AWS re:Invent ALX319, It's All in the Data, The Machine Learning Behind Alexa's AI Systems, by Rajiv Reddy (November 28, 2017).

mandates that a Skill Manifest be present for each Skill and keeps track of such manifests. Likewise, the Skill Management API and Interaction Model Schema also exist as a registry of Skills available to Alex for the capabilities of service providing agents, and for selecting from the registry at least one service providing agent capable of completing a sub goal.<sup>31</sup>

213. Further, Alexa also interprets a service request in the form of a base goal, which is communicated with an ICL that includes a conversational protocol layer defined by event types and parameter lists associated with the event type. Alexa, via an orchestrator, sends a voice clip to the SLU, which returns Intents for the user.<sup>32</sup> The orchestrator then processes those requests to send to various Skills. The interaction between orchestrator and Skill is delivered through a highly structured JSON schema, which Amazon describes as the protocol interface between the Alexa Service and the Skill (hosted as either a web service or Lambda function—a service offered by Amazon Web Services).<sup>33</sup> A non-limiting example of such communication is disclosed, which at least in some instances is described as Intents, utterances, and slots, which are communicated through a highly structured JSON schema<sup>34</sup>:

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<sup>31</sup> <https://developer.amazon.com/docs/smapi/skill-manifest.html>;

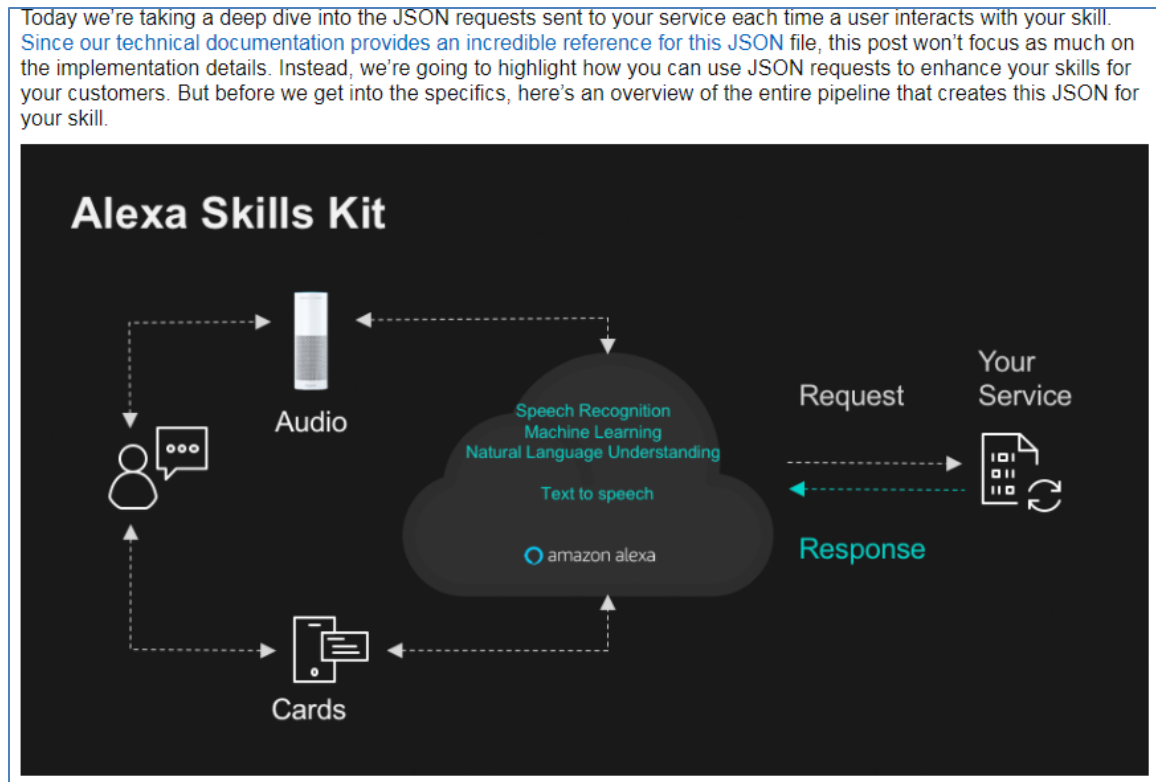
<https://developer.amazon.com/docs/smapi/ask-cli-intro.html>;

<https://developer.amazon.com/docs/smapi/interaction-model-schema.html>.

<sup>32</sup> PowerPoint Presentation Entitled MBL310, Alexa Voice Service Under the Hood (October 2015).

<sup>33</sup> <https://developer.amazon.com/docs/custom-skills/request-and-response-json-reference.html>; <https://developer.amazon.com/blogs/alexa/post/1c9f0651-6f67-415d-baa2-542ebc0a84cc/build-engaging-skills-what-s-inside-the-alexa-json-request>.

<sup>34</sup> <https://developer.amazon.com/blogs/alexa/post/1c9f0651-6f67-415d-baa2-542ebc0a84cc/build-engaging-skills-what-s-inside-the-alexa-json-request>.



214. For example, certain phrases, which Alexa refers to as Intents, include event types, and those event types further have a list of parameters that refine those events:<sup>35</sup>

1. **Intents:** An *intent* represents an action that fulfills a user's spoken request. Intents can optionally have arguments called *slots*.
2. **Sample utterances:** A set of likely spoken phrases mapped to the intents. This should include as many representative phrases as possible.
3. **Custom slot types:** A representative list of possible values for a slot. Custom slot types are used for lists of items that are not covered by one of Amazon's built-in slot types.
4. **Dialog model** (optional): A structure that identifies the steps for a *multi-turn conversation* between your skill and the user to collect all the information needed to fulfill each intent. This simplifies the code you need to write to ask the user for information.

This document defines these components and explains how to create them within developer console beta.

<sup>35</sup> <https://developer.amazon.com/docs/custom-skills/create-the-interaction-model-for-your-skill.html>.

215. Additionally, for built-in Intents created by Amazon, there is a further example of the Intent signature that third parties can also use in developing Skills for Alexa, which further illustrates an ICL:<sup>36</sup>

### Intent Signature Syntax

Each built-in intent has an *intent signature*. You provide this signature as the name of the *intent* in your intent schema. This example shows a schema with two *WeatherForecast* intents:

Developer Console Beta
Old Console

```
{
  "languageModel": {
    "invocationName": "my weather",
    "intents": [
      {
        "name": "AMAZON.SearchAction<object@WeatherForecast>",
        "slots": [],
        "samples": []
      },
      {
        "name": "AMAZON.SearchAction<object@WeatherForecast[temperature]>",
        "slots": [],
        "samples": []
      }
    ],
    "types": []
  }
}
```

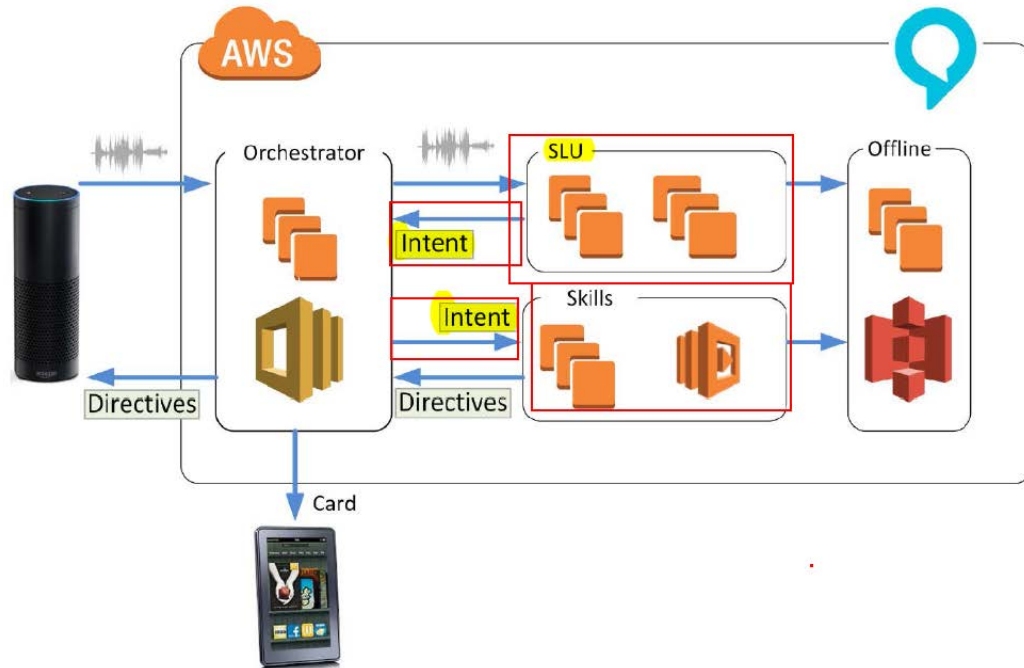
See [Interaction Model Schema](#) for the complete intent schema compatible with the developer console beta, the skill builder, and the Skill Management API.

216. Alexa also determines sub-goals necessary to accomplish the base goal, and then selecting an agent to complete the sub goal and delegating the sub goal as a peer to peer service directly from the service requesting agent to the service providing agent. As part of defining intents for Alexa's skill orchestration, so that sub goals can be determined to identify a Skill<sup>37</sup>:

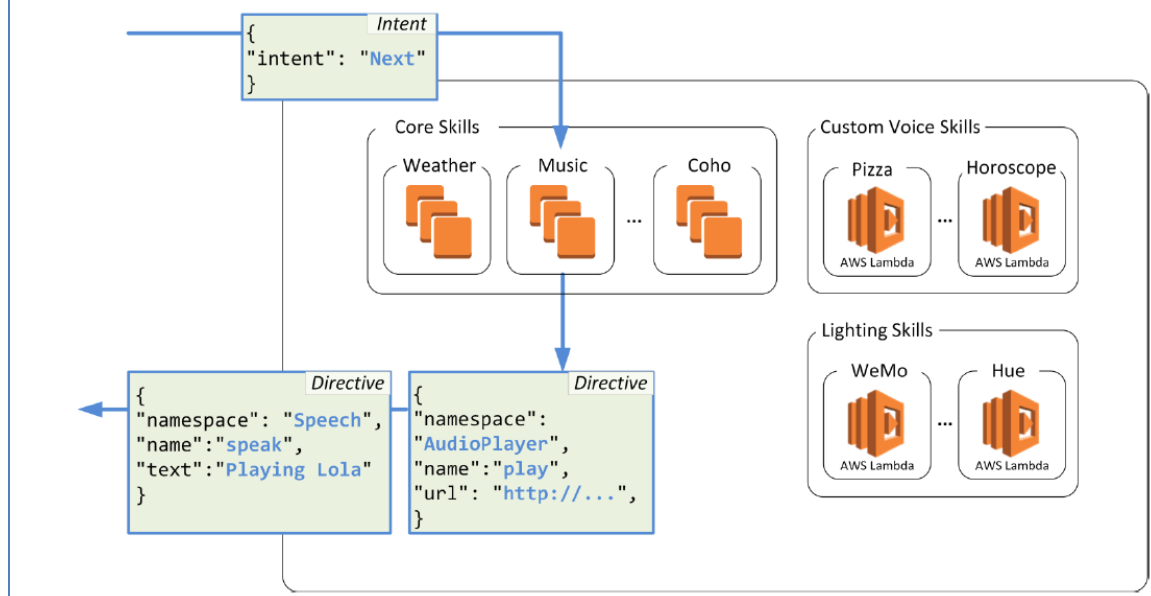
<sup>36</sup> <https://developer.amazon.com/docs/custom-skills/built-in-intent-library.html>.

<sup>37</sup> PowerPoint Presentation Entitled MBL310, Alexa Voice Service Under the Hood (October 2015).

Case 1:16-cv-01266-RGA Document 28-2 Filed 03/28/18 Page 78 of 110 PageID #: 705

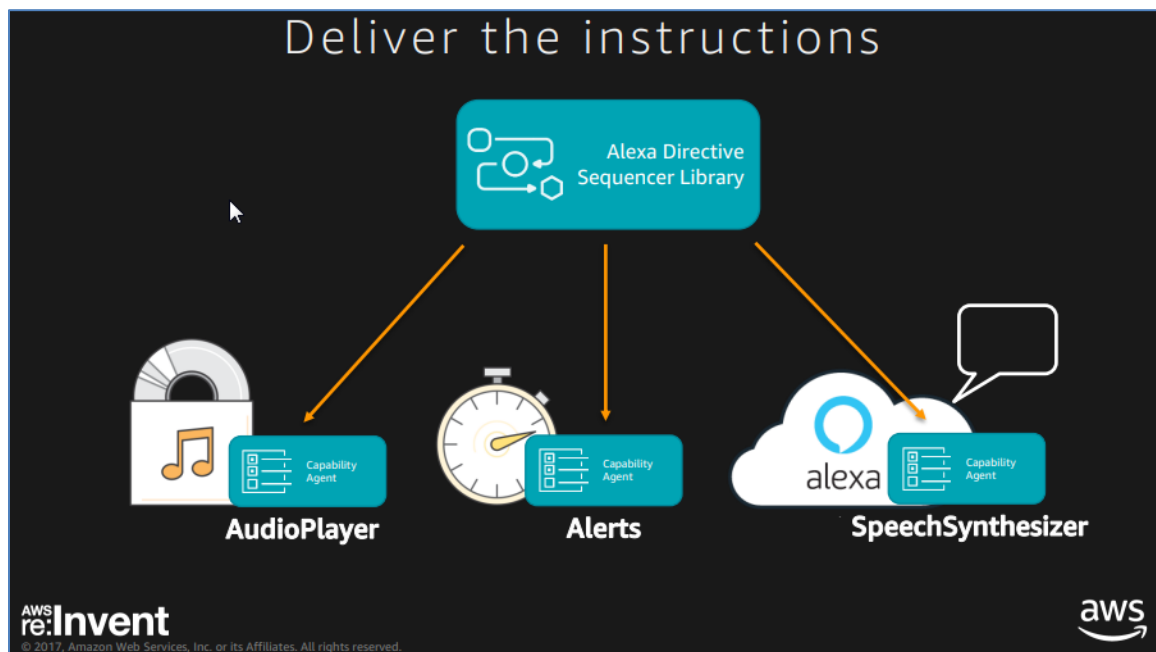


## Skill orchestration: Focus & Context



217. In some instances, Alexa also delegates the sub goal as a peer to peer service directly from the service requesting agent to the service providing agent. For example, Alexa also includes various “capability agents” such as AudioPlayer, Alerts,

and SpeechSynthesizer, that are part of the core product, and receive instructions from the Alexa Directive Sequencer Library:<sup>38</sup>



218. Defendants have also infringed indirectly and continue to infringe indirectly the '560 Patent by active inducement under 35 U.S.C. § 271(b).

219. On information and belief, Defendants gained knowledge of the '560 Patent no later than the filing of this complaint or shortly thereafter.

220. On information and belief, Defendants have intended, and continue to intend, to induce patent infringement by its users and has had knowledge that the inducing acts would cause infringement or has been willfully blind to the possibility that the inducing acts would cause infringement.

<sup>38</sup> Integrate Alexa Voice Technology Into Your Product with the Alexa Voice Service, AWS re:INVENT 2017, Travis Grizzel (2017).

221. For example, Defendants encourage end users to use a process for providing coordinated task completion within a distributed computing environment that includes a method for (1) an agent registry including capabilities of service providing electronic agents, (2) interpreting a service request in the form of a base goal, which is communicated with an ICL that includes a conversational protocol layer defined by event types and parameter lists associated with the event type (3) determining sub-goals necessary to accomplish the base goal, and then selecting an agent to complete the sub goal, and delegating the sub goal as a peer to peer service directly from the service requesting agent to the service providing agent, and delegating any remaining sub goals to selected agents capable of completing the remaining sub goals.

222. Defendants have also infringed indirectly and continue to infringe indirectly the '560 Patent by contributory infringement under 35 U.S.C. § 271(c).

223. Defendants have and continue to intentionally commit contributory infringement by selling, offering to sell, or importing the infringing products, which include non-standard software that has no substantial non-infringing use, including but not limited to Amazon Alexa, the Echo Products, and the Fire Products, with the knowledge that Amazon Alexa, the Echo Products, the Fire Products will be used by users with, for example, the Alexa Device SDK to directly infringe at least claim 52 of the '560 patent.

224. Since at March 12, 2018, when Defendants received a copy of the proposed First Amended Complaint, Defendants have been and still are willfully infringing the '560 Patent. On information and belief, at least as early March 12, 2018, Defendants had actual knowledge of the '560 Patent. Despite having actual knowledge



of the '560 Patent, Defendants have continued to willfully, wantonly, and deliberately infringe the '560 Patent. Accordingly, Plaintiff seeks enhanced damages pursuant to 35 U.S.C. § 284 and a finding that this is an exceptional case within the meaning of 35 U.S.C. § 285, entitling Plaintiff to its attorneys' fees and expenses.

225. To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '560 Patent.

226. As a result of Defendants' infringement of the '560 Patent, Plaintiff has been injured by Defendants' unauthorized use of Plaintiff's intellectual property. Plaintiff seeks monetary damages in an amount adequate to compensate for Defendants' infringement, but in no event less than a reasonable royalty for the use made of the invention by Defendants, together with interest and costs as fixed by the Court, and Plaintiff will continue to suffer damages in the future unless Defendants' infringing activities are enjoined by this Court.

227. Unless a permanent injunction is issued enjoining Defendants and its agents, servants, employees, representatives, affiliates, and all others acting or in active concert therewith from infringing the '560 Patent, Plaintiff will be greatly and irreparably harmed.

**COUNT III**  
**(Infringement of U.S. Patent No. 7,036,128)**

228. Plaintiff re-alleges and incorporates by reference the allegations in the foregoing paragraphs as if fully set forth herein.

229. Plaintiff is informed and believes, and on that basis alleges, that Defendants have infringed and is currently infringing one or more claims (*e.g.*, claim 1) of the '128 Patent, in violation of 35 U.S.C. § 271.

230. Defendants have infringed and are currently infringing literally and/or under the doctrine of equivalents, by, among other things, making, using, offering for sale, selling, and/or importing within this judicial district and elsewhere in the United States, without license or authority, infringing products, including but not limited to Amazon Alexa, the Echo Products, the Fire Products, and related products and/or processes falling within the scope of one or more claims of the '128 Patent, including claim 1:

1. A collaborative computer-implemented community of distributed electronic agents, organized to provide a mobile computing environment, the computer-implemented community of distributed electronic agents comprising:

an agent registry wherein one or more capabilities of each of the electronic agents are registered in the form of an interagent communication language (ICL), wherein the interagent language includes a layer of conversational protocol defined by event types and parameter lists associated with one or more events, and wherein the parameter lists further refine the one or more events;

a facilitator agent arranged to coordinate cooperative task completion among the electronic agents by delegating one or more received ICL goals to a selected one or more of the electronic agents based upon the registered capabilities of the selected agents;

one or more service-providing electronic agents, being in bi-directional communication with the facilitator agent, including at least one location agent operable to ascertain a current physical location of a user; and

one or more computer interface agents being in bi-directional communication with the facilitator agent, the mobile computer interface agents being operable to process at least one mobile user input type and to responsively generate and present to the facilitator agent one or more ICL goals corresponding to the user's desired request.

231. Defendants' acts of making, using, offering for sale, selling, and/or importing infringing products, including but not limited to Amazon Alexa, the Echo Products, the Fire Products, and related products and/or processes satisfy, literally or

under the doctrine of equivalents, each and every claim limitation, including but not limited to limitations of claim 1.<sup>39</sup>

232. Defendants directly infringe claim 1 by making, using, offering for sale, selling, and/or importing the claimed computer-implemented community of distributed electronic agents, and/or by putting the claimed computer-implemented community of distributed electronic agents as a whole into service, and/or by controlling the claimed computer-implemented community of distributed electronic agents as a whole and benefiting from the use of each claimed element. Defendant controls the computer-implemented community of distributed electronic agents as a whole by making, using, offering for sale, selling, and or importing the each claimed element of the computer-implemented community of distributed electronic agents, under strict controls and processes, including an agent registry, a facilitator agent, one or more service providing agents, and one more computer interface agents in accordance with the claims, by dictating the schema, communication protocol, and means for accessing and joining the computer-implemented community of distributed electronic agents, though SDKs and agreements, as further explained below. Further, Defendant benefits from each element of the claimed computer-implemented community of distributed electronic agents by creating a revenue-generating ecosystem that facilitates the interaction of various agents for task completion.

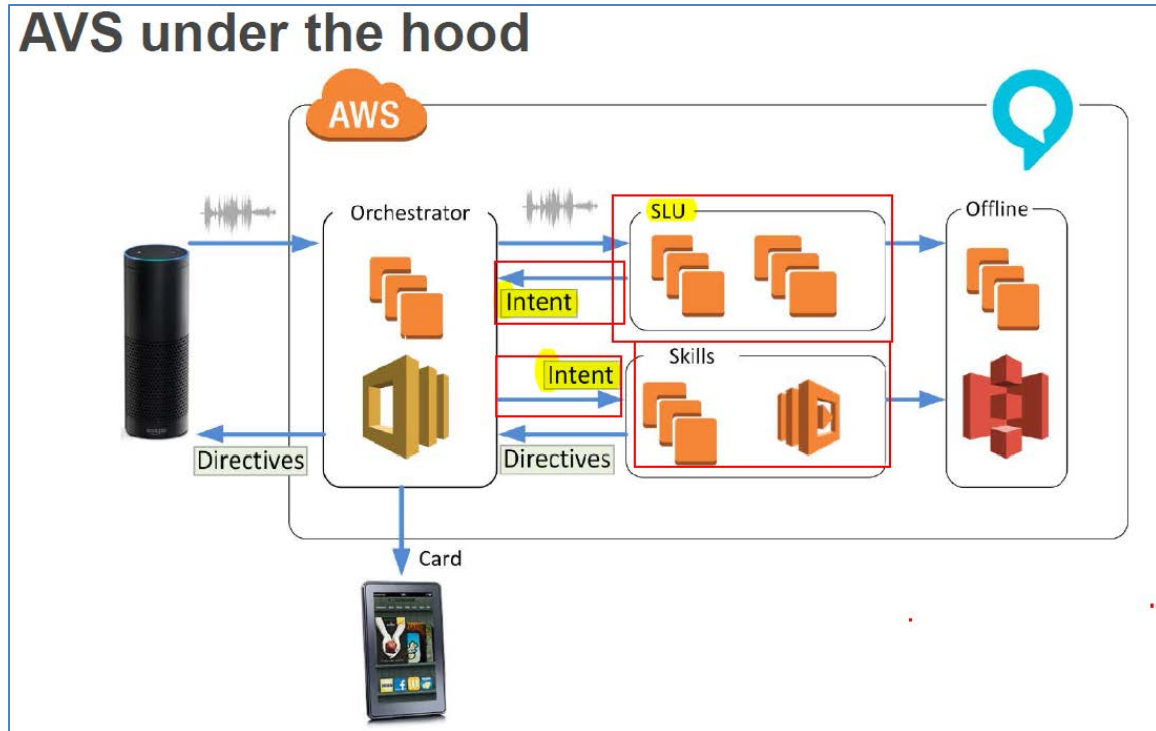
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<sup>39</sup> Plaintiff expressly reserves the right to identify additional asserted claims in its infringement contentions in accordance with the local patent rules. Claim 1 is provided for notice pleading only and is not presented as an “exemplary” claim of all other claims in the ’128 patent.

233. For example, Defendants' Amazon Alexa, the Echo Products, the Fire Products uses a collaborative computer-implemented community of distributed electronic agents organized to provide a mobile computing environment. Amazon Alexa, the Echo Products, the Fire Products includes such a community of distributed electronic agents with (1) an agent registry where capabilities of each electronic agent is registered in the claimed interagent communication language (ICL), (2) a facilitator agent arranged to coordinate cooperative task completion by delegating one or more received ICL goals to one or more electronic agent based on its registered capabilities, (3) at least one service providing agent with bi-directional communication with the facilitator agent and including at least one location agent operable to ascertain a current physical location of a user, and (4) at least one computer interface agents in bi-directional communication with the facilitator agent that can process at least one mobile user input type and responsively generate and present to the facilitator agent one or more ICL goals corresponding to the user's desired request, as described in a 2015 presentation:<sup>40</sup>

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<sup>40</sup> PowerPoint Presentation Entitled MBL310, Alexa Voice Service Under the Hood (October 2015).



234. For example, a user can ask what the weather is and Alexa then uses an agent to ascertain the current physical location of the user and other agents in bi-directional communication with the facilitator to present responsive information corresponding the user's desired request.<sup>41</sup>

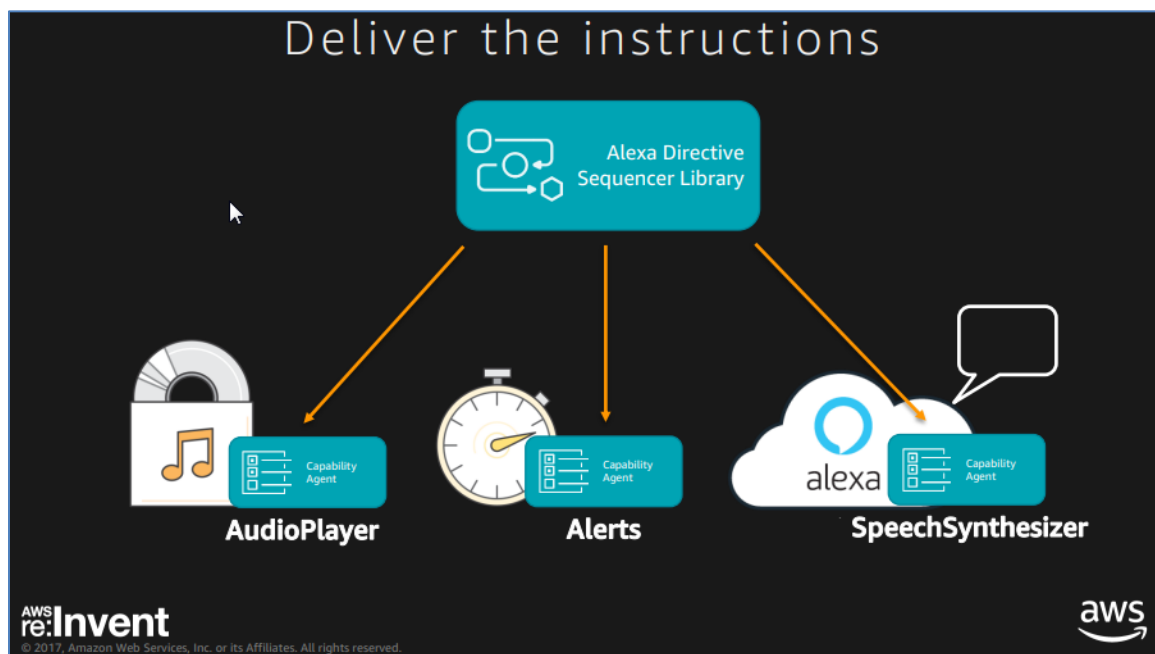
235. Alexa accesses a community of distributed electronic agents operating by using information and goals recorded in inter-agent communication language (ICL). This includes at least the use of a facilitator agent including a registry recording agent capability, and arranged to coordinate cooperative task completion, service providing agents, and computer interface agents.

236. A non-limiting example of such communication is shown in the AVS Under The Hood Image, where the query by the Orchestrator to the Skills based on the

<sup>41</sup> <https://developer.amazon.com/docs/custom-skills/weatherforecast-intents.html>

Intent is an example where Alexa looks to a registry that includes capabilities of service-providing electronic agents, for example agents built by third parties as apps. All Skills, however, must be registered with Alexa in the Developer Portal and be configured to communicate via OAuth 2.0. Other examples of schemas Amazon mandates for interaction with Alexa include the Skill Manifest<sup>42</sup>, the Alexa Skill Management API<sup>43</sup>, and the Interaction Model Schema<sup>44</sup>

237. Alexa also includes various “capability agents” such as AudioPlayer, Alerts, and SpeechSynthesizer, that are part of the core product, and receive instructions from the Alexa Directive Sequencer Library<sup>45</sup>:



<sup>42</sup> <https://developer.amazon.com/docs/smapi/skill-manifest.html>.

<sup>43</sup> <https://developer.amazon.com/docs/smapi/ask-cli-intro.html>.

<sup>44</sup> <https://developer.amazon.com/docs/smapi/interaction-model-schema.html>.

<sup>45</sup> Integrate Alexa Voice Technology Into Your Product with the Alexa Voice Service, AWS re:INVENT 2017, Travis Grizzel (2017).

238. A facilitator agent is able to parse a service requesting order to interpret a compound goal set forth within the request, where the request is formed according to an ICL. For Example, Alexa, via an orchestrator, sends a voice clip to the SLU, which returns Intents for the user.<sup>46</sup> The orchestrator then processes those requests to send to various Skills. The interaction between orchestrator and Skill is delivered through a highly structured JSON schema, which Amazon describes as the protocol interface between the Alexa Service and the Skill (hosted as either a web service or Lambda function—a service offered by Amazon Web Services.<sup>47</sup>

239. Alexa uses an ICL that includes both a conversational protocol layer composed of event types and parameters, as well as a content layer that is comprised of one or more goals, triggers, and data elements associated with the events. A non-limiting example of such communication is disclosed, which at least in some instances is described as Intents, utterances, and slots, which are communicated through a highly structured JSON schema<sup>48</sup>:

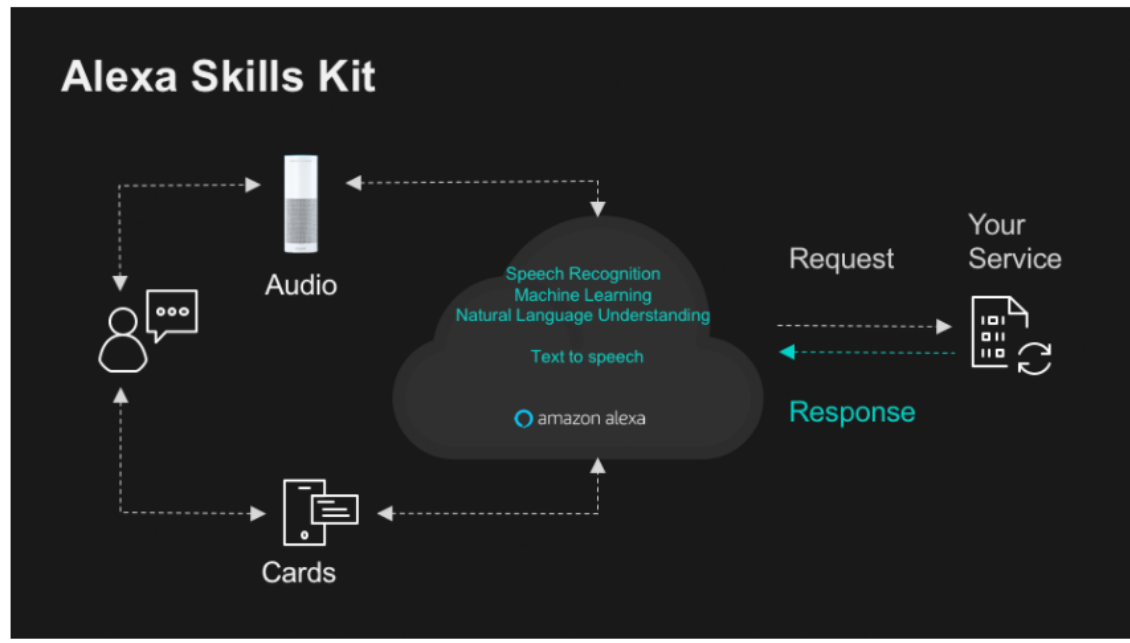
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<sup>46</sup> PowerPoint Presentation Entitled MBL310, Alexa Voice Service Under the Hood (October 2015).

<sup>47</sup> <https://developer.amazon.com/docs/custom-skills/request-and-response-json-reference.html>; <https://developer.amazon.com/blogs/alexa/post/1c9f0651-6f67-415d-baa2-542ebc0a84cc/build-engaging-skills-what-s-inside-the-alexa-json-request>.

<sup>48</sup> <https://developer.amazon.com/blogs/alexa/post/1c9f0651-6f67-415d-baa2-542ebc0a84cc/build-engaging-skills-what-s-inside-the-alexa-json-request>.

Today we're taking a deep dive into the JSON requests sent to your service each time a user interacts with your skill. Since our technical documentation provides an incredible reference for this JSON file, this post won't focus as much on the implementation details. Instead, we're going to highlight how you can use JSON requests to enhance your skills for your customers. But before we get into the specifics, here's an overview of the entire pipeline that creates this JSON for your skill.



240. For example, certain phrases, which Alexa refers to as Intents, include event types, and those event types further have a list of parameters that refine those events:<sup>49</sup>

1. **Intents:** An *intent* represents an action that fulfills a user's spoken request. Intents can optionally have arguments called *slots*.
2. **Sample utterances:** A set of likely spoken phrases mapped to the intents. This should include as many representative phrases as possible.
3. **Custom slot types:** A representative list of possible values for a slot. Custom slot types are used for lists of items that are not covered by one of Amazon's built-in slot types.
4. **Dialog model** (optional): A structure that identifies the steps for a *multi-turn conversation* between your skill and the user to collect all the information needed to fulfill each intent. This simplifies the code you need to write to ask the user for information.

This document defines these components and explains how to create them within developer console beta.

<sup>49</sup> <https://developer.amazon.com/docs/custom-skills/create-the-interaction-model-for-your-skill.html>.



241. Additionally, for built-in Intents created by Amazon, there is a further example of the Intent signature that third parties can also use in developing Skills for Alexa, which further illustrates an ICL:<sup>50</sup>



242. Defendants have also infringed indirectly and continue to infringe indirectly the '128 Patent by active inducement under 35 U.S.C. § 271(b).

243. On information and belief, Defendants gained knowledge of the '128 Patent at or around March 28, 2017, the date on which the Examiner disclosed the reference to an affiliate of Defendants in a References Cited during the prosecution of U.S. Patent App. No. 13/858,847 (issued as U.S. Patent No. 9,772,035).

<sup>50</sup> <https://developer.amazon.com/docs/custom-skills/built-in-intent-library.html>.

244. On information and belief, Defendants have intended, and continue to intend, to induce patent infringement by its users and have had knowledge that the inducing acts would cause infringement or has been willfully blind to the possibility that the inducing acts would cause infringement.

245. For example, Defendants encourage end users to employ a collaborative computer-implemented community of distributed electronic agents organized to provide a mobile computing environment as claimed in claim 1 of the '128 Patent through the very nature of the products. As a further example, Defendants instruct users to use a collaborative computer-implemented community of distributed electronic agents organized to provide a mobile computing environment as claimed in claim 1 of the '128 Patent. By continuing to provide instructions to users on how to use the infringing products to employ a collaborative computer-implemented community of distributed electronic agents organized to provide a mobile computing environment as claimed in claim 1 of the '128 Patent, and by continuing to encourage such use, Defendants have and continue to specifically intend to induce infringement of the '128 Patent.

246. Defendants have also infringed indirectly and continue to infringe indirectly the '128 Patent by contributory infringement under 35 U.S.C. § 271(c).

247. Defendants have and continue to intentionally commit contributory infringement by selling, offering to sell, or importing the infringing products, which include non-standard software that has no substantial non-infringing use, including but not limited to Amazon Alexa, the Echo Product, and the Fire Products, with the knowledge that the these products will be used by users with, for example, the Amazon Alexa SDK to directly infringe at least claim 1 of the '128 patent.

248. Since at least March 12, 2018 when Defendants received a copy of the proposed First Amended Complaint, and on information and belief since a date before the filing of this Complaint in light of repeated references to the '128 Patent in Defendants' prosecution of its own patent applications, Defendants have been and still are willfully infringing the '128 Patent. On information and belief, on or about March 28, 2017, Defendant had actual knowledge of the '128 Patent. Despite having actual knowledge of the '128 Patent, Defendant has continued to willfully, wantonly, and deliberately infringe the '128 Patent. Accordingly, Plaintiff seeks enhanced damages pursuant to 35 U.S.C. § 284 and a finding that this is an exceptional case within the meaning of 35 U.S.C. § 285, entitling Plaintiff to its attorneys' fees and expenses.

249. To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '128 Patent.

250. As a result of Defendants' infringement of the '128 Patent, Plaintiff has been injured by Defendants' unauthorized use of Plaintiff's intellectual property. Plaintiff seeks monetary damages in an amount adequate to compensate for Defendants' infringement, but in no event less than a reasonable royalty for the use made of the invention by Defendants, together with interest and costs as fixed by the Court, and Plaintiff will continue to suffer damages in the future unless Defendants' infringing activities are enjoined by this Court.

251. Unless a permanent injunction is issued enjoining Defendants and their agents, servants, employees, representatives, affiliates, and all others acting or in active concert therewith from infringing the '128 Patent, Plaintiff will be greatly and irreparably harmed.

**COUNT IV**  
**(Infringement of U.S. Patent No. 6,742,021)**

252. Plaintiff re-alleges and incorporates by reference the allegations in the foregoing paragraphs as if fully set forth herein.

253. Plaintiff is informed and believes, and on that basis alleges, that Defendants have infringed and are currently infringing one or more claims (*e.g.*, claim 1) of the '021 Patent, in violation of 35 U.S.C. § 271.

254. Defendants have infringed and are currently infringing literally and/or under the doctrine of equivalents, by, among other things, making, using, offering for sale, selling, and/or importing within this judicial district and elsewhere in the United States, without license or authority, infringing products, including but not limited to the Fire Products, and related products and/or processes falling within the scope of one or more claims of the '021 Patent, including claim 1. Exemplary claim 1 is reproduced below:

A method for speech-based navigation of an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, comprising the steps of:

- (a) receiving a spoken request for desired information from the user;
- (b) rendering an interpretation of the spoken request;
- (c) constructing at least part of a navigation query based upon the interpretation;
- (d) soliciting additional input from the user, including user interaction in a non-spoken modality different than the original request without requiring the user to request said non-spoken modality;
- (e) refining the navigation query, based upon the additional input;
- (f) using the refined navigation query to select a portion of the electronic data source; and

(g) transmitting the selected portion of the electronic data source from the network server to a client device of the user.


255. Defendants' acts of making, using, offering for sale, selling, and/or importing infringing products, including but not limited to Fire TV, Fire TV Stick, Fire TV Gaming Edition, Fire tablet, and Fire HD tablet, and related products and/or processes satisfy, literally or under the doctrine of equivalents, each and every claim limitation, including but not limited to limitations of claim 1. For example, Defendants' Fire TV product uses speech-based navigation of an electronic data source. The Fire TV product receives a spoken request for desired information from the user (such as a spoken request for sports scores, weather, music, or a particular television show or movie), renders an interpretation of the spoken request, constructs at least part of a navigation query based on the spoken request, solicits additional input from the user, including user interaction in a non-spoken modality different than the original request without requiring the user to request the non-spoken modality, and transmits the selected portion from a network server to the Fire TV device, as described on the Fire TV product page at <http://amazon.com>.<sup>51</sup>

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<sup>51</sup>Plaintiff expressly reserves the right to identify additional asserted claims in its infringement contentions in accordance with the local patent rules. Claim 1 is provided for notice pleading only and is not presented as an "exemplary" claim of all other claims in the '021 patent.



- Now with Alexa, use your Fire TV Voice Remote to check local theater times, news, sports scores, the weather, play music, and more - just ask
- Enjoy over 4,000 channels, apps, and games including access to over 250,000 TV episodes and movies on Netflix, Amazon Video, HBO GO, Hulu, and more.
- Cutting the cord? Watch the best of live TV on NBC News, NBA, and Sling TV, which includes ESPN, CNN, HGTV, AMC, A&E, Cartoon Network, and more.
- Say it. Watch it. Simply say the name of what you want to watch and start enjoying in seconds.



## SAY IT, WATCH IT

Less searching, more watching. Speak into your Fire TV Voice Remote to instantly play TV shows, movies, games, and more.

**Voice search that actually works**

Amazon Fire TV Voice Remote lets you instantly search TV shows, movies, actors, and genres using just your voice—no more typing with your remote to find what you want. Launch apps by saying "Open Netflix," and play Amazon Video and Add-On Subscription content from Starz, Showtime, and more—just say "Play the movie Ex Machina," or "Watch Catastrophe." Our Universal voice search is supported for over 75 channels and apps including Netflix, Hulu, Vevo, HBO NOW, HGTV, and Showtime.

Use voice commands to control playback of Amazon videos - just say, "Rewind 60 seconds," "Jump ahead 2 minutes or," "Next episode."

**Our customers have spoken**

**"Voice search is very well done... a huge time saver and a great convenience."**  
—kpc001, 5-star review

**"Voice search—it works and works very well, just as they advertised (a very pleasant surprise)."**  
—Chris T., 5-star review

**"I searched for 'Person of Interest' and 'The Big Bang Theory' and it returned the results instantly...You simply say what you want to watch and it will bring it up."**  
—WiseShopper, 4-star review

256. Defendants have also infringed indirectly and continue to infringe indirectly the '021 Patent by active inducement under 35 U.S.C. § 271(b).

257. On information and belief, Defendants have intended, and continue to intend, to induce patent infringement by its users and have had knowledge that the inducing acts would cause infringement or have been willfully blind to the possibility that their inducing acts would cause infringement.

258. For example, Defendants encourage end users to perform speech-based navigation of an electronic data source using a method as claimed in claim 1 of the '021 Patent through the very nature of the products. As a further example, Defendants instruct users on how to use the infringing products to perform speech-based navigation of an electronic data source using a method as claimed in claim 1 of the '021 Patent (*e.g.*, “Use Your Voice to Search Amazon Fire TV Devices,” *available at* <https://www.amazon.com/gp/help/customer/display.html?nodeId=201497650>). By using the infringing products to perform speech-based navigation of an electronic data source, users directly infringe at least claim 1 of the '021 Patent. By continuing to provide instructions to users on how to use the infringing products to perform speech-based navigation of an electronic data source using a system as claimed in claim 1 of the '021 Patent, and by continuing to encourage such use, Defendants have and continue to specifically intend to induce infringement of the '021 Patent.

259. Defendants have also infringed indirectly and continue to infringe indirectly the '021 Patent by contributory infringement under 35 U.S.C. § 271(c).

260. Defendants have and continue to intentionally commit contributory infringement by selling, offering to sell, or importing the infringing products, which include non-standard software that has no substantial non-infringing use, including but not limited to the Fire TV Stick, with the knowledge that the Fire TV Stick will be used

by users with, for example, the Amazon Fire TV Remote app on users' smartphones to directly infringe at least claim 1 of the '021 Patent.

261. Since at least by December 19, 2016, Defendants have been and still are willfully infringing the '021 Patent. On information and belief, at least as early as December 19, 2016, Defendants had actual knowledge of the '021 Patent. Despite having actual knowledge of the '021 Patent, Defendants have continued to willfully, wantonly, and deliberately infringe the '021 Patent. Accordingly, Plaintiff seeks enhanced damages pursuant to 35 U.S.C. § 284 and a finding that this is an exceptional case within the meaning of 35 U.S.C. § 285, entitling Plaintiff to its attorneys' fees and expenses.

262. To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '021 Patent.

263. As a result of Defendants' infringement of the '021 Patent, Plaintiff has suffered monetary damages in an amount adequate to compensate for Defendants' infringement, but in no event less than a reasonable royalty for the use made of the invention by Defendants, together with interest and costs as fixed by the Court, and Plaintiff will continue to suffer damages in the future unless Defendants' infringing activities are enjoined by this Court.

264. Unless a permanent injunction is issued enjoining Defendants and their agents, servants, employees, representatives, affiliates, and all others acting or in active concert therewith from infringing the '021 Patent, Plaintiff will be greatly and irreparably harmed.

**COUNT V**  
**(Infringement of U.S. Patent No. 6,523,061)**



265. Plaintiff re-alleges and incorporates by reference the allegations in the foregoing paragraphs as if fully set forth herein.

266. Plaintiff is informed and believes, and on that basis alleges, that Defendants have infringed and are currently infringing one or more claims (*e.g.*, claim 1) of the '061 Patent, in violation of 35 U.S.C. § 271.

267. Defendants have infringed and are currently infringing literally and/or under the doctrine of equivalents, by, among other things, making, using, offering for sale, selling, and/or importing within this judicial district and elsewhere in the United States, without license or authority, infringing products, including but not limited to Fire TV, Fire TV Stick, Fire TV Gaming Edition, Fire tablet, Fire HD tablet, Echo, Echo Dot, and Tap, and related products and/or processes falling within the scope of one or more claims of the '061 Patent, including claim 1. Exemplary claim 1 reproduced below:

A method for utilizing agents for speech-based navigation of an electronic data source, comprising the steps of:

- (a) receiving a spoken request for desired information from a user;
- (b) rendering an interpretation of the spoken request;
- (c) constructing a navigation query based upon the interpretation;
- (d) routing the navigation query to at least one agent, wherein the at least one agent utilizes the navigation query to select a portion of the electronic data source; and
- (e) invoking a user interface agent for outputting the selected portion of the electronic data source to the user, wherein a facilitator manages data flow among multiple agents and maintains a registration of each of said agents' capabilities.


268. Defendants' acts of making, using, offering for sale, selling, and/or importing infringing products, including but not limited to Fire TV, Fire TV Stick, Fire TV Gaming Edition, Fire tablet, Fire HD tablet, Echo, Echo Dot, and Tap, and related

products and/or processes satisfy, literally or under the doctrine of equivalents, each and every claim limitation, including but not limited to limitations of claim 1. For example, Defendants' Fire TV product uses speech-based navigation of an electronic data source. The Fire TV product receives a spoken request for desired information from the user (such as a spoken request for sports scores, weather, music, or a particular television show or movie), renders an interpretation of the spoken request, constructs a navigation query based on the interpretation, routes the navigation query to at least one agent that utilizes the navigation query to select a portion of the electronic data source, and invokes a user interface agent for outputting the selected portion of the electronic data source wherein a facilitator manages data flow among multiple agents and maintains a registration of each of the agents' capabilities, as described on the Fire TV product page at <http://amazon.com>.<sup>52</sup>



<sup>52</sup> Plaintiff expressly reserves the right to identify additional asserted claims in its infringement contentions in accordance with the local patent rules. Claim 1 is provided for notice pleading only and is not presented as an “exemplary” claim of all other claims in the ’061 patent.

- Now with Alexa, use your Fire TV Voice Remote to check local theater times, news, sports scores, the weather, play music, and more - just ask
- Enjoy over 4,000 channels, apps, and games including access to over 250,000 TV episodes and movies on Netflix, Amazon Video, HBO GO, Hulu, and more.
- Cutting the cord? Watch the best of live TV on NBC News, NBA, and Sling TV, which includes ESPN, CNN, HGTV, AMC, A&E, Cartoon Network, and more.
- Say it. Watch it. Simply say the name of what you want to watch and start enjoying in seconds.



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Use voice commands to control playback of Amazon videos - just say, "Rewind 60 seconds," "Jump ahead 2 minutes or," "Next episode."

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—kpc001, 5-star review

**"Voice search—it works and works very well, just as they advertised (a very pleasant surprise)."**  
—Chris T., 5-star review

**"I searched for 'Person of Interest' and 'The Big Bang Theory' and it returned the results instantly...You simply say what you want to watch and it will bring it up."**  
—WiseShopper, 4-star review

269. Defendants' Echo product, for instance, also uses speech-based navigation of an electronic data source. The Echo product receives a spoken request for desired information from the user (such as a spoken request to play music, provide information, news, sports scores, or weather), renders an interpretation of the spoken request, constructs a navigation query based on the interpretation, routes the navigation query to at least one agent that utilizes the navigation query to select a portion of the electronic data source, and invokes a user interface agent for outputting the selected portion of the electronic data source wherein a facilitator manages data flow among multiple agents and maintains a registration of each of the agents' capabilities, as described on the Echo product page at <http://amazon.com>:



Amazon Echo is a hands-free speaker you control with your voice. Echo connects to the Alexa Voice Service to play music, provide information, news, sports scores, weather, and more—instantly. All you have to do is ask.

270. Defendants have also infringed indirectly and continue to infringe indirectly the '061 Patent by active inducement under 35 U.S.C. § 271(b).

271. On information and belief, Defendants gained knowledge of the '061 Patent at least as early as November 2012, the date on which the Examiner of Amazon's U.S. Patent App. No. 13/172,567 (issued as U.S. Patent No. 9,723,035) cited the '061 Patent. Defendants also became aware of the '061 Patent through the disclosure of the '061 Patent in other patent applications, including affiliate Amazon Technologies Inc.'s patent, U.S. Patent No. 8,977,966.

272. On information and belief, Defendants further confirmed its knowledge of the '061 Patent no later than the filing of this complaint or shortly thereafter.

273. On information and belief, Defendants have intended, and continue to intend, to induce patent infringement by its users and have had knowledge that the

inducing acts would cause infringement or have been willfully blind to the possibility that their inducing acts would cause infringement.

274. For example, Defendants encourage end users to perform speech-based navigation of an electronic data source using a method as claimed in claim 1 of the '061 Patent through the very nature of the products. As a further example, Defendants instruct users on how to use the infringing products to perform speech-based navigation of an electronic data source using a method as claimed in claim 1 of the '061 Patent (*e.g.*, “Use Your Voice to Search Amazon Fire TV Devices,” *available at* <https://www.amazon.com/gp/help/customer/display.html?nodeId=201497650>). By using the infringing products to perform speech-based navigation of an electronic data source, users directly infringe at least claim 1 of the '061 Patent. By continuing to provide instructions to users on how to use the infringing products to perform speech-based navigation of an electronic data source using a system as claimed in claim 1 of the '061 Patent, and by continuing to encourage such use, Defendants have and continue to specifically intend to induce infringement of the '061 Patent.

275. Defendants have also infringed indirectly and continue to infringe indirectly the '061 Patent by contributory infringement under 35 U.S.C. § 271(c).

276. Defendants have and continue to intentionally commit contributory infringement by selling, offering to sell, or importing the infringing products, which include non-standard software that has no substantial non-infringing use, including but not limited to the Fire TV Stick, with the knowledge that the Fire TV Stick will be used by users with, for example, the Amazon Fire TV Remote app on users' smartphones to directly infringe at least claim 1 of the '061 patent.

277. Since at least November 2012, Defendants have been and still are willfully infringing the '061 Patent. On information and belief, at least as early as November 2012, Defendants had actual knowledge of the '061 Patent. Despite having actual knowledge of the '061 Patent, Defendants have continued to willfully, wantonly, and deliberately infringe the '061 Patent. Accordingly, Plaintiff seeks enhanced damages pursuant to 35 U.S.C. § 284 and a finding that this is an exceptional case within the meaning of 35 U.S.C. § 285, entitling Plaintiff to its attorneys' fees and expenses.

278. To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '061 Patent.

279. As a result of Defendants' infringement of the '061 Patent, Plaintiff has suffered monetary damages in an amount adequate to compensate for Defendants' infringement, but in no event less than a reasonable royalty for the use made of the invention by Defendants, together with interest and costs as fixed by the Court, and Plaintiff will continue to suffer damages in the future unless Defendants' infringing activities are enjoined by this Court.

280. Unless a permanent injunction is issued enjoining Defendants and their agents, servants, employees, representatives, affiliates, and all others acting or in active concert therewith from infringing the '061 Patent, Plaintiff will be greatly and irreparably harmed.

**COUNT VI**  
**(Infringement of U.S. Patent No. 6,757,718)**

281. Plaintiff re-alleges and incorporates by reference the allegations in the foregoing paragraphs as if fully set forth herein.

282. Plaintiff is informed and believes, and on that basis alleges, that Defendants have infringed and are currently infringing one or more claims (*e.g.*, claim 1) of the '718 Patent, in violation of 35 U.S.C. § 271.

283. Defendants have infringed and are currently infringing literally and/or under the doctrine of equivalents, by, among other things, making, using, offering for sale, selling, and/or importing within this judicial district and elsewhere in the United States, without license or authority, infringing products, including but not limited to Fire TV, Fire TV Stick, Fire TV Gaming Edition, Echo with Alexa Voice Remote, and Echo Dot with Alexa Voice Remote, and related products and/or processes falling within the scope of one or more claims of the '718 Patent, including claim 1. Exemplary claim 1 is reproduced below:

A method for speech-based navigation of an electronic data source located at one or more network servers located remotely from a user, wherein a data link is established between a mobile information appliance of the user and the one or more network servers, comprising the steps of:

- (a) receiving a spoken request for desired information from the user utilizing the mobile information appliance of the user, wherein said mobile information appliance comprises a portable remote control device or a set-top box for a television;
- (b) rendering an interpretation of the spoken request;
- (c) constructing a navigation query based upon the interpretation;
- (d) utilizing the navigation query to select a portion of the electronic data source; and
- (e) transmitting the selected portion of the electronic data source from the network server to the mobile information appliance of the user.

284. Defendants' acts of making, using, offering for sale, selling, and/or importing infringing products, including but not limited to Fire TV, Fire TV Stick, Fire

TV Gaming Edition, Echo with Alexa Voice Remote, and Echo Dot with Alexa Voice Remote, and related products and/or processes satisfy, literally or under the doctrine of equivalents, each and every claim limitation, including but not limited to limitations of claim 1. For example, Defendants' Fire TV product uses speech-based navigation and includes a set-top box for a television and a portable remote control device. The Fire TV product receives a spoken request for desired information from the user (such as a spoken request for sports scores, weather, music, or a particular television show or movie), renders an interpretation of the spoken request, constructs a navigation query, utilizes the navigation query to select a portion of an electronic data source, and transmits the selected portion from a network server to the Fire TV device, as described on the Fire TV product page at <http://amazon.com>.<sup>53</sup>





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<sup>53</sup> Plaintiff expressly reserves the right to identify additional asserted claims in its infringement contentions in accordance with the local patent rules. Claim 1 is provided for notice pleading only and is not presented as an “exemplary” claim of all other claims in the ’718 patent.



- Now with Alexa, use your Fire TV Voice Remote to check local theater times, news, sports scores, the weather, play music, and more - just ask
- Enjoy over 4,000 channels, apps, and games including access to over 250,000 TV episodes and movies on Netflix, Amazon Video, HBO GO, Hulu, and more.
- Cutting the cord? Watch the best of live TV on NBC News, NBA, and Sling TV, which includes ESPN, CNN, HGTV, AMC, A&E, Cartoon Network, and more.
- Say it. Watch it. Simply say the name of what you want to watch and start enjoying in seconds.



## SAY IT, WATCH IT

Less searching, more watching. Speak into your Fire TV Voice Remote to instantly play TV shows, movies, games, and more.

**Voice search that actually works**

Amazon Fire TV Voice Remote lets you instantly search TV shows, movies, actors, and genres using just your voice—no more typing with your remote to find what you want. Launch apps by saying "Open Netflix," and play Amazon Video and Add-On Subscription content from Starz, Showtime, and more—just say "Play the movie Ex Machina," or "Watch Catastrophe." Our Universal voice search is supported for over 75 channels and apps including Netflix, Hulu, Vevo, HBO NOW, HGTV, and Showtime.

Use voice commands to control playback of Amazon videos - just say, "Rewind 60 seconds," "Jump ahead 2 minutes or," "Next episode."

**Our customers have spoken**

**"Voice search is very well done... a huge time saver and a great convenience."**  
—kpc001, 5-star review

**"Voice search—it works and works very well, just as they advertised (a very pleasant surprise)."**  
—Chris T., 5-star review


**"I searched for 'Person of Interest' and 'The Big Bang Theory' and it returned the results instantly...You simply say what you want to watch and it will bring it up."**  
—WiseShopper, 4-star review

285. Defendants' Echo product with Alexa Voice Remote, for instance, also uses speech-based navigation and includes a portable remote control device. The Echo product receives a spoken request for desired information from the user (such as a spoken request to play music, provide information, news, sports scores, or weather), renders an interpretation of the spoken request, constructs a navigation query, utilizes the navigation query to select a portion of an electronic data source, and transmits the selected portion from a network server to the Echo device, as described on the Echo and Alexa Voice Remote product pages at <http://amazon.com>:

286.



Amazon Echo is a hands-free speaker you control with your voice. Echo connects to the Alexa Voice Service to play music, provide information, news, sports scores, weather, and more—instantly. All you have to do is ask.



Roll over image to zoom in

### Alexa Voice Remote for Amazon Echo and Echo Dot

by [Amazon](#)

★★★★★ 568 customer reviews  
| 127 answered questions

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Price: **\$29.99** | **FREE** One-Day  
Delivered tomorrow for FREE with qualifying orders over \$35. [Details](#)

**In Stock.**  
Ships from and sold by Amazon Digital Services LLC. Gift-wrap available.

- Official remote for Amazon Echo and Echo Dot (Not compatible with Amazon Tap)
- Connects to Amazon Echo and Echo Dot via Bluetooth
- Includes an integrated microphone for when you are too far away or it's too noisy for Echo to hear you
- Dedicated buttons for volume up, volume down, play/pause, previous, and next
- Amazon Echo and Echo Dot work with one remote at a time

287. Defendants have also infringed indirectly and continue to infringe indirectly the '718 Patent by active inducement under 35 U.S.C. § 271(b).

288. On information and belief, Defendants gained knowledge of the '718 Patent at least as early as March 2016, when their affiliate Amazon Technologies Inc. disclosed the '718 Patent in an Information Disclosure Statement during the prosecution of its own patent, U.S. Patent No. 9,424,840. In any event, on information and belief, Defendants gained knowledge of the '718 Patent no later than the filing of this complaint or shortly thereafter.

289. On information and belief, Defendants have intended, and continue to intend, to induce patent infringement by its users and have had knowledge that the inducing acts would cause infringement or have been willfully blind to the possibility that their inducing acts would cause infringement.

290. For example, Defendants encourage end users to perform speech-based navigation of an electronic data source using a method as claimed in claim 1 of the '718 Patent through the very nature of the products. As a further example, Defendants instruct users on how to use the infringing products to perform speech-based navigation of an electronic data source using a method as claimed in claim 1 of the '718 Patent (*e.g.*, "Use Your Voice to Search Amazon Fire TV Devices," *available at* <https://www.amazon.com/gp/help/customer/display.html?nodeId=201497650>). By using the infringing products to perform speech-based navigation of an electronic data source, users directly infringe at least claim 1 of the '718 Patent. By continuing to provide instructions to users on how to use the infringing products to perform speech-based navigation of an electronic data source using a method as claimed in claim 1 of the '718 Patent, and by continuing to encourage such use, Defendants have and continue to specifically intend to induce infringement of the '718 Patent.

291. Defendants have also infringed indirectly and continue to infringe indirectly the '718 Patent by contributory infringement under 35 U.S.C. § 271(c).

292. Defendants have and continue to intentionally commit contributory infringement by selling, offering to sell, or importing the infringing products, which include non-standard software that has no substantial non-infringing use, including but not limited to the Fire TV Stick, with the knowledge that the Fire TV Stick will be used by users with, for example, the Amazon Fire TV Remote app on users' smartphones to directly infringe at least claim 1 of the '718 Patent.

293. Since at least March 2016, Defendants have been and still are willfully infringing the '718 Patent. On information and belief, at least as early as March 2016, Defendants had actual knowledge of the '718 Patent. Despite having actual knowledge of the '718 Patent, Defendants have continued to willfully, wantonly, and deliberately infringe the '718 Patent. Accordingly, Plaintiff seeks enhanced damages pursuant to 35 U.S.C. § 284 and a finding that this is an exceptional case within the meaning of 35 U.S.C. § 285, entitling Plaintiff to its attorneys' fees and expenses.

294. To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '718 Patent.

295. As a result of Defendants' infringement of the '718 Patent, Plaintiff has suffered monetary damages in an amount adequate to compensate for Defendants' infringement, but in no event less than a reasonable royalty for the use made of the invention by Defendants, together with interest and costs as fixed by the Court, and Plaintiff will continue to suffer damages in the future unless Defendants' infringing activities are enjoined by this Court.

296. Unless a permanent injunction is issued enjoining Defendants and their agents, servants, employees, representatives, affiliates, and all others acting or in active concert therewith from infringing the '718 Patent, Plaintiff will be greatly and irreparably harmed.

**PRAYER FOR RELIEF**

Plaintiff prays for the following relief:

- A. A judgment that Defendants have infringed one or more claims of the '021, '061, '718, '115, '128, and/or '560 Patents (collectively, "Asserted Patents");
- B. A permanent injunction enjoining Defendants and its officers, directors, agents, servants, affiliates, employees, divisions, branches, subsidiaries, parents, and all others acting in active concert or participation with Defendant, from infringing the Asserted Patents;
- C. An award of damages resulting from Defendants' acts of infringement in accordance with 35 U.S.C. § 284;
- D. A judgment and order finding that this is an exceptional case within the meaning of 35 U.S.C. § 285 and awarding to Plaintiff its reasonable attorneys' fees against Defendant.
- E. A judgment and order requiring Defendants to provide accountings and to pay supplemental damages to Plaintiff, including, without limitation, prejudgment and post-judgment interest; and
- F. Any and all other relief to which Plaintiff may show itself to be entitled.

**JURY TRIAL DEMANDED**

Plaintiff hereby demands a trial by jury of all issues so triable.

Dated: March 28, 2018

BAYARD, P.A.

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